THE

physical therapy

REVIEW

Volume 34 - Number 6 June 1954

A Study of the Reproducibility of Muscle Testing and Certain Other Aspects of Muscle Scoring
— LILIENFELD, JACOBS, and WILLIS

Physical Therapy for Cervical Injuries: A Head Traction Set for Home Use — SCHMALENBECK

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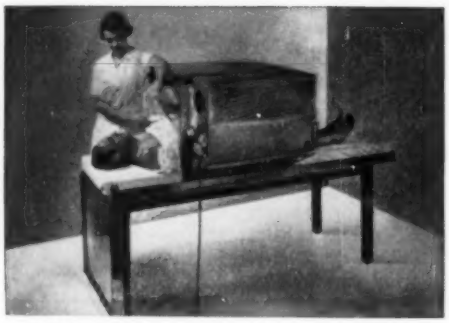

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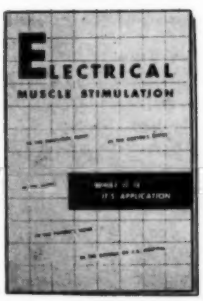

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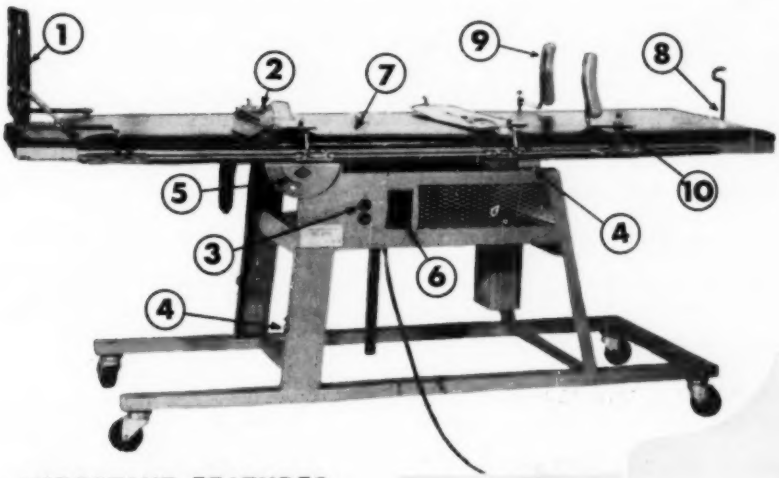

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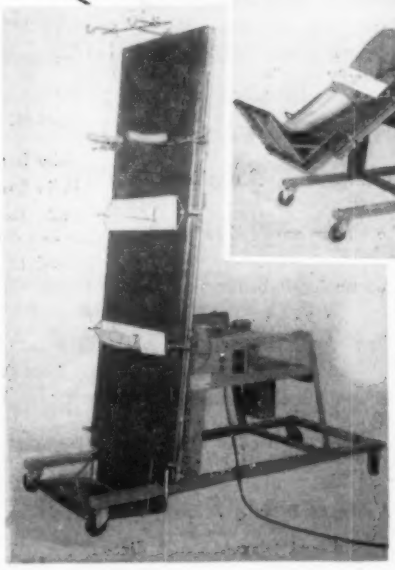

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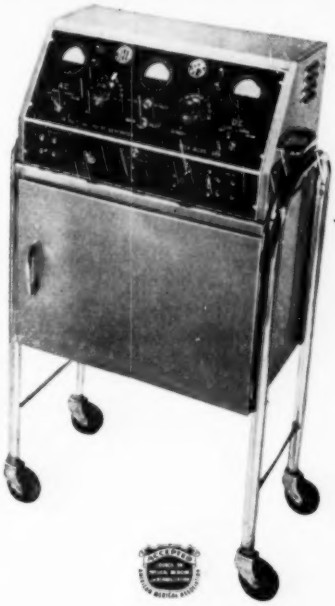

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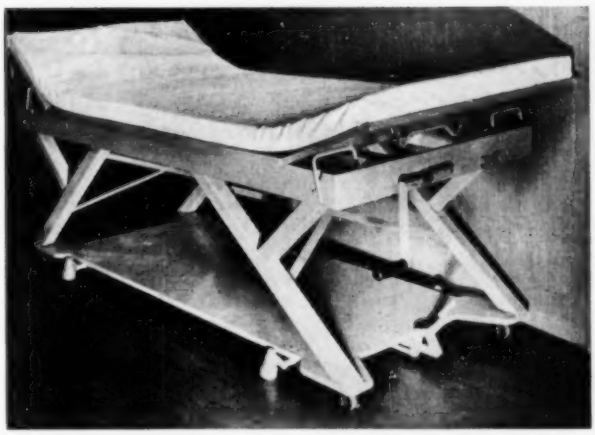

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The Physical Therapy Review

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Vol. 34 **June 1954** **Number 6**

*A Study of the Reproducibility of Muscle Testing and Certain Other Aspects of Muscle Scoring**

Abraham M. Lilienfeld, M.D., M.P.H., Miriam Jacobs, B.A., and Myron Willis, M.A.

The evaluation of the efficacy of an agent in the prophylaxis or modification of severity of paralytic poliomyelitis requires a consistent method of measuring the severity of disease. The selection of a measurement or index of severity is dependent upon the frame of reference within which severity is viewed. For example, from a pathological viewpoint, severity of poliomyelitis would best be expressed in terms of the number of motor neurons involved, while within a functional frame of reference, severity would be expressed in terms of the ability of the individual to carry out the routines of daily living. These two particular viewpoints are not necessarily exclusive, since there is obviously a relationship between loss of function and the number of motor neurons involved. At times, however, they are mutually exclusive, since the loss of function may be related to the location of the areas of involvement and not to the extent of the involvement. The best illustration of this is death resulting from the involvement of the respiratory center, representing only a small amount of nervous tissue. Another important consideration is that a certain number of neurons may have to be involved before functional effects become manifested. Analysis of functional effects solely may overlook effects which, from the viewpoint of the prophylactic agent being investigated, are biologically important.

In evaluating an agent in preventing or modifying the severity of paralytic poliomyelitis, the most desirable measurement of severity would be the percentage of motor neurons involved. It is impossible to obtain such a measurment in human populations. Hammon et al., in their 1952 gamma globulin field trials, utilized an index of severity of disease that was developed with the assistance of Dr. Jessie Wright. Using gravity and manual resistance as criteria of muscle strength, the muscle or muscle groups were graded into the six categories of normal, good, fair, poor, trace, and no power. A factor proportionate to its bulk is assigned to each muscle or muscle group. The tibialis anticus was selected as a standard and assigned a factor of 1. The various factors for other muscles ranged from the smallest, 0.25

* From the Communicable Disease Center, Public Health Service, U. S. Department of Health, Education, and Welfare, Atlanta, Georgia, and the D. T. Watson School of Physiatrics, affiliated with the University of Pittsburgh School of Medicine, Leetsdale, Pennsylvania.

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Miriam Jacobs, Instructor, Physical Therapy, D. T. Watson School of Physiatrics, Leetsdale, Pennsylvania.

Myron Willis, Statistician, Epidemiology Branch, CDC, Atlanta, Georgia.

(represented by the interossei or lumbricales) to 4 (represented by the quadriceps femoris). This factor is multiplied by a numerical representation of the grade of the muscle, 0 for normal to 5 for no power. The scores for all muscles of each patient are added to provide a total score. The highest score possible was 560 and the ratio of the patient's score to this total represents percentage muscle bulk involved. The grading of cranial nerve involvement was performed in an analogous although different manner. Gonnella et al., have described this method of scoring. It is important to emphasize that the muscle bulk does not necessarily represent the number of the motor neurons involved, since the innervation ratios of various muscles are not known.

Other possible indices of severity that could be utilized are as follows: 1) ratio of nonparalytic to paralytic cases; 2) percentage of paralytic cases who have residual paralysis at 60 or 90 days after the date of onset of the disease; 3) number of body areas involved, such as one extremity, two extremities, one extremity and trunk. All of these indices of severity are valid, but are obviously not as exact as the percentage of muscle bulk involved. In addition, all of these indices represent the grouping of the results of grading individual muscles or muscle groups into groups of varying breadth. In an evaluation of a prophylactic agent, it would appear highly desirable to utilize several indices of severity, since it is not known which is best.

In the National Program for the Evaluation of Gamma Globulin in the Prophylaxis of Paralytic Poliomyelitis in 1953, the method of muscle testing used was similar to that used in the Hammon Studies. The muscles were grouped differently and the factor ratings differed somewhat. Listing of the cranial nerve musculature was revised along with a method of scoring that differed from that used by Hammon. The highest possible muscle score in the 1953 version was 470. The form for the muscle testing procedure and the instructions for scoring are contained in Figure 1.

In order to provide a necessary background for the determination of methods of analysis of the data collected in this program, certain aspects of this method of muscle evaluation were investigated. The first was concerned with the determination of the reproducibility of muscle evaluations. This was considered to be of prime importance since the evaluation of the cases to be studied in the program was to be performed by about 35 physical therapists in the field. This would obviously influence, in varying degrees, of course, any of the indices mentioned above. It was considered of interest also to investigate whether the utilization of weighting factors would result in the introduction of certain biases. This report presents the results of several studies of these aspects of the method of muscle evaluation viewed in the light of their influence on the final methods to be used in the Gamma Globulin Evaluation Program.

VARIABILITY BETWEEN EXAMINERS

Method of Study:

The study of the variability between examiners in muscle evaluation, was performed in a series of four small scale trials. The designs of these trials varied, depending upon the circumstances of the time and place under which they were carried out. In one such trial, it was possible to actually design an experiment with random allocation of examiners, while in another, it was possible only to compare the scores of different examiners which were obtained at a practice session. These data were obtained on the last days of several four and/or five-day orientation courses at which the examiners — physical therapists, nurses or physicians — were instructed in the method of examination by the same physical therapy instructor. These orientation sessions were planned for the field personnel working in the program in an attempt to obtain consistency in muscle evaluation. A few experienced nurse officer epidemiologists were included in the first orientation session in order to familiarize them with the total program, but were not expected to perform muscle examinations for the final analysis of the study.

Information concerning the places and times of these trials, number and age ranges of patients used, number and types of examiners and other points are summarized in Table 1.

Results:

The results of the muscle evaluations performed by the different examiners can be compared in numerous ways. The most obvious one is that obtained by directly comparing the muscle scores determined by the different examiners. The results of such a comparison for all four trials are presented in Tables 2 and 3. To summarize these comparisons, average differences between various examiners were computed. For Trial 1 these are presented in Table 4 and for the other trials in Table 5.

The scores obtained at Trial 1 are presented separately since there were five examiners in this trial as compared to three examiners in the other

TABLE 1

Summary of Information Concerning Experimental Trials of Reproducibility of Muscle Examinations

Trial No.	Place of Trial	Date	No. in Trial	Patients: Age Range	Patients: Months Since Onset of Polio	Areas Evaluated	Number and Profession of Examiners
1	D. T. Watson School of Physiatrics, Leetsdale, Pa.	July 18	9	5-17	12-24	One body area (Extremity or trunk)	Physicians 18 Nurses 8 Physical Therapy Instructors 3
2	D. T. Watson School of Physiatrics, Leetsdale, Pa.	July 20	14	6-34	2-22	Total Muscle Evaluation	Physical Therapists 14 Physical Therapy Instructors 2
3	School of Physical Therapy, Northwestern Univ. School of Medicine, Chicago, Illinois	Aug. 3	12	7-42	9-24	Total Muscle Evaluation	Physical Therapists 15 Physician 1 Physical Therapy Instructor 1
4	Orthopedic Hospital Los Angeles, Calif.	Aug. 31	10	3-36	9-61	Total Muscle Evaluation (Except for one Patient)	Physicians 4 Physical Therapists 7 Physical Therapy Instructor 1

three trials. In addition, only certain areas of the body were examined at this trial, while the entire patient was evaluated at the other trials. The scores obtained during Trial 1 represent only the percentage of muscle bulk involved of the particular body area examined.

From Table 4 it may be noted that the greatest average difference of 9.1 per cent in Trial 1 was present in a comparison of the 2nd and 3rd and of the 3rd and 4th examiners. However, from Table 2, it is apparent that the results of the 3rd examiner of patient 1D make the largest contribution to this difference. If the results of this examiner are omitted, the average difference between 2nd and 3rd examiners is diminished to 5.1 per cent and to 5.0 per cent for the comparison between 3rd and 4th examiners. These differences are of the same general order of magnitude of the other comparisons. Since the 2nd and 4th examiners were the instructing physical therapists, these comparisons represent what may be considered a comparison of the results of the physicians (1st and 5th examiners) and nurses (3rd examiner) with a standard. It is apparent from these comparisons that in general, there was very little difference between the results obtained by the physicians and nurses except for one individual nurse who obviously had difficulty in one particular patient. When one considers that these physicians and nurses

TABLE 2

A Comparison of Muscle Scores as Determined by Five Different Examiners in Trial 1

Patient	Muscle Groups Examined	Muscle Scores (Expressed as Percent Involved) Obtained by Different Examiners: 1st	2nd	3rd	4th	5th
1A	Left Upper	45	43	45	45	40
1B	Left Lower	7	7	9	14	7
1C	Trunk	27	27	25	27	27
1D	Trunk	24	37	9	48*	28
1E	Right Lower	39	44	39	43	48
1F	Trunk	19	15	14	15	14
1G	Right Upper	24	29	15	30	22
1H	Right Upper	64	61	46	—	49
1I	Left Lower	23	30	21	28	26

*Rest Period

Note:
1st and 5th examiners are physicians.
2nd and 4th examiners are physical therapy instructors.
3rd examiner is a nurse.

MUSCLE EXAMINATION

% INVOLVEMENT
TOTAL SCORE
DIAGNOSIS

NAME _____ I ☐ S ☐
Last First Middle

ADDRESS _____
Street

_____
City County State

PARENT'S NAME _____ PHONE _____

BIRTHDATE _____
INJECTION DATE _____
ONSET DATE _____
MUSCLE EXAMINATION DATE _____

LEFT				RIGHT		
S	NV	G		G	NV	S
			RESPIRATION			
			0.5 Diaphragm 0.5			
			0.5 Intercostals 0.5			
			VOICE			
			Nasal			
			0.25 Hoarse 0.25			
			Syllabic Speech			
			Decreased Volume			
			0.5 **FACE** 0.5			
			Ocular			
			Nasal			
			Oral			
			NECK			
			1 Anterior 1			
			1 Lateral 1			
			UPPER EXTREMITIES			
			1 Scapula Adductors 1			
			1 Serratus Magnus 1			
			1 Pectoralis Major 1			
			2 Inward Rotators 2			
			1 Outward Rotators 1			
			1 Deltoideus 1			
			2 Elbow Flexors 2			
			1 Triceps 1			
			1 Wrist Flexors 1			
			1 Wrist Extensors 1			
			1 Finger Flexors 1			
			1 Finger Extensors 1			
			0.25 Opponens Pollicis 0.25			
			0.25 Thumb Abductors 0.25			
			0.25 Thumb Flexors 0.25			
			0.25 Thumb Extensors 0.25			
			TOTAL SCORE			

LEFT				RIGHT		
S	NV	G		G	NV	S
			0.25 *DEGLUTITION 0.25			
			Degree 1			
			Degree 2			
			Degree 3			
			0.25 **TONGUE** 0.25			
			Deviation			
			Atrophy			
			0.5 **MASTICATION** 0.5			
			Deviation			
			Lacks Firm Closure			
			Atrophy			
			0.25 **PALATE** 0.25			
			TRUNK			
			3 Erector Spinae 3			
			1 Anterior Abdominals 1			
			2 Lateral Abdominals 2			
			LOWER EXTREMITIES			
			2 Gluteus Maximus 2			
			1 Hip Flexors 1			
			1 Gluteus Medius 1			
			2 Hip Adductors 2			
			4 Quadriceps 4			
			2 Inner Hamstrings 2			
			1 Outer Hamstring 1			
			3 Gastronemius 3			
			1 Tibialis Anticus 1			
			1 Tibialis Anticus 1			
			1 Peroneals 1			
			1 Toe Flexors 1			
			1 Toe Extensors 1			
			TOTAL SCORE			

EXAMINER: _____

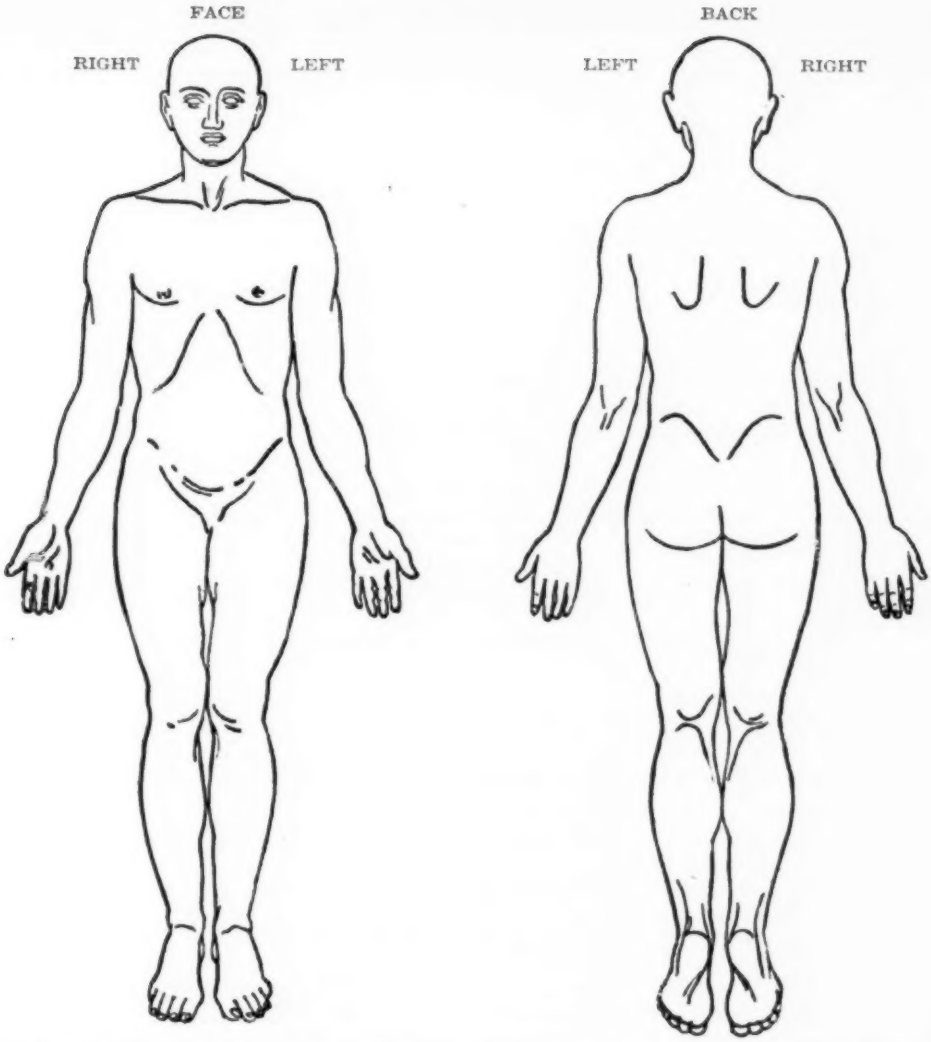
N or 100% NORMAL	G or 75% GOOD	F or 50% FAIR	P or 25% POOR	T or 10% TRACE	N.P. or 0 NO POWER	†, ††, ††† Spasm according to severity
Function against gravity and resistance	Function against gravity and some resistance	Function against gravity only	Function in horizontal plane	A few fibers have active function		

Respiration, Voice, Face, Deglutition, Tongue, Mastication and Palate checked (✓) to show involvement Qualitative grade not attempted.

*Degree 1—Accumulation of secretions present; patient able to clear throat and swallow without help.
Degree 2—Excess amount of secretions but area can be cleared by suctioning.
Degree 3—Area fills rapidly; suctioning not sufficient and tracheotomy necessary.

Highest Score Possible 470

Figure 1 — Front



COMMENTS

Figure 1 — Back

SCORING INSTRUCTIONS

1. Note letter grades N, G, F, P, T, O in the column marked "G."
2. Transpose letter grades to numerical values in column marked "NV." Code as follows:

Grade:	Numerical Value:
N	— 0
G	— 1
F	— 2
P	— 3
T	— 4
O	— 5

3. In the columns where there is a check (✓) and not a letter grade, indicate the following numerical values in the column marked "NV."

Respiration

Diaphragm (✓) — 3
Intercostals (✓) — 3

Voice

Hoarse (✓) — 3

Face

Ocular (✓)
Nasal (✓)
Oral (✓)

If 1 of the above is checked place *1* opposite *Face* in"NV" column.
If 2 of the above are checked place *2* opposite *Face* in"NV" column.
If 3 of the above are checked place *3* opposite *Face* in"NV" column.

Deglutition

Degree 1 (✓) — 1 opposite Deglutition in "NV" column.
Degree 2 (✓) — 2 opposite Deglutition in "NV" column.
Degree 3 (✓) — 3 opposite Deglutition in "NV" column.

Tongue

Deviation (✓)
Atrophy (✓)
If any of the above are checked place *3* opposite *Tongue* in "NV" column.

Mastication

Deviation (✓)
Lacks firm closure (✓)
Atrophy (✓)
If any of the above are checked place *3* opposite *Mastication* in "NV" column.

Palate (✓) — 3

4. Multiply the numerical value by the factor rating (listed on either side of the muscle) and place this score in the column marked "S."
5. Total all columns marked "S" and place the grand total in space provided in box at top of muscle examination form.
6. Calculate percent involvement and place in space provided in box at top of muscle examination form. To obtain percent involvement: Divide the total score by 470.

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were, prior to this orientation session, essentially unfamiliar with muscle testing, these comparisons indicate a rather high degree of consistency in muscle evaluation.

The results obtained by the 2nd and 4th examiners, who were the instructing physical therapists, were compared. The average difference was found to be 3.0 per cent (Table 4). This increased degree of consistency indicates the importance of training and experience in performing muscle testing.

The results of the various comparisons in the other three trials are presented in Table 5. In general, the average difference between two examiners is approximately 3.0 per cent, which is similar to that obtained in a comparison of the physical therapists in Trial 1.

From these comparisons of the muscle scores obtained by different examiners it would appear that there exists a rather high degree of consistency in the determination of per cent muscle bulk involved. A major objection that can be raised to such an inference is that there may exist a large amount of inapparent inconsistency, since the muscle score is an average of grades of individual muscles which has been weighted by a factor related to muscle bulk. The use of such an average may well cancel out actual differences that may exist between examiners. For example, a muscle graded as a G muscle with a score of 1 and a bulk factor of 2 contributes 2 to the score and a muscle with a bulk factor of 1 graded as Fair, likewise contributes 2 to the total score. Even though another examiner would

TABLE 3

A Comparison of Muscle Scores as Determined by Three Different Examiners in Trials 2, 3 & 4

Patient	Muscle Scores (Expressed as Percent Involved) as Obtained by Different Examiners		
	First	Second	Third
	Trial 2		
2A	15	16	15
2B	24	22	21
2C	43	42	39
2D	52	44	48
2E	26	26	22
2F	7	22	33
2G	53	51	56
2H	22	19	19
2I	17	16	16
2J	19	20	18
2K	29	38	34
2L	33	33	30
2M	15	14	13
2N	6	9	6
	Trial 3		
3A	15	10	18
3B	7	6	11
3C	8	12	10
3D	28	32	29
3E	32	26	26
3F	28	26	25
3G	6	10	8
3H	19	16	15
3I	9	7	9
3J	22	22	24
3K	4	7	5
3L	5	3	4
	Trial 4		
4A	8	14	6
4B	1	1	0
4C	12	14	14
4D	9	17	7
4E	54	52	56
4F	13	14	14
4G	33	31	28
4H	38	38	31
4I	2	8	8
4J	9	6	5

grade these two muscles differently, the difference in grading would not be manifested in the total score.

In order to answer this objection, a direct comparison was made of the frequency with which two examiners agreed in the actual grading of a muscle. In addition, in cases of disagreement the frequency of the various sizes of disagreement was determined. The results of the various comparisons are presented in Table 6 for Trials 1, 3 and 4. The data for Trial 2 were not available for this type of analysis. In Trial 1 the physicians and nurses were compared with the instructor nearest to them in the examination sequence and the two instructors who were the 2nd and 4th examiners were likewise compared. The totals in these individual comparisons differ because there were twice as many physician examiners as nurses and one examination by an instructor was omitted because the patient was too tired.

The term "absolute difference" requires some interpretation. A zero difference means that the grading by the two examiners agreed. An absolute difference of one represents a difference of plus or minus one grade. For example, if one examiner graded a muscle as F and another graded it as a G or a P, this was classified as representing

TABLE 4

Average Differences in Muscle Scores Between Various Examiners in Trial 1

Comparisons Between Examiners	Average Differences in Muscle Scores
First and Second	4.5%
Second and Third	9.1%
Third and Fourth	9.1%
Fourth and Fifth	6.0%
Total of above comparisons	7.1%
Second and Third (With Nurse 4 omitted)	5.1%
Third and Fourth (With Nurse 4 omitted)	5.0%
Total comparisons (With Nurse 4 omitted)	5.3%
Second and Fourth (Instructors)	3.0%

TABLE 5

Average Differences in Muscle Scores Between the Various Examiners in Trials 2, 3 and 4

Trial	Average Differences in Muscle Score Between 1st and 2nd Examiners	2nd and 3rd Examiners	1st and 3rd Examiners
2	3.4%	3.0%	4.2%
3	3.1%	2.4%	2.4%
4	3.0%	3.4%	3.2%
All Three Trials	3.2%	2.9%	3.3%

TABLE 6

The Distribution of Differences in the Grading of Individual Muscles by Different Examiners, Trials 1, 3 and 4

Trial 1

Absolute Differences in Muscle Grade	GROUPS COMPARED: Physician and Instructor Nearest Them		Nurses and Instructor Nearest Them		Two Instructors	
	Frequency of Occurrence	Cumulative Percentage	Frequency of Occurrence	Cumulative Percentage	Frequency of Occurrence	Cumulative Percentage
0	138	60	52	45	65	66
1	72	91	46	85	29	95
2	14	97	8	92	4	99
3	4	99	4	96	1	100
4	1		5	100		
5	1					
Total	230		115		99	

Trial 3

Absolute Differences in Muscle Grade	1st & 2nd Examiners		1st & 3rd Examiners		2nd & 3rd Examiners	
	Frequency of Occurrence	Cumulative Percentage	Frequency of Occurrence	Cumulative Percentage	Frequency of Occurrence	Cumulative Percentage
0	594	73	600	74	613	75
1	187	96	184	96	166	96
2	22	99	21	99	32	99
3	11	100	11	100	4	100
4	1					
5						
Total	815		816		815	

Trial 4

0	436	67	469	71	441	67
1	208	98	169	97	191	96
2	16	100	17	99	25	99
3			3	99.9	1	99.9
4			1	99.9	1	99.9
5			1	100	1	100
Total	660		660		660	

an absolute difference of one grade. On the other hand, if the second examiner graded the muscle as N or T, it would represent an absolute difference of two grades.

From Table 6 one notes that the physicians agreed completely with the instructors in 60 per cent of muscles tested and within plus or minus one grade in 91 per cent of muscles tested. On the other hand, the performance of the nurses was not quite as good, since they agreed completely in 45 per cent of muscles and within plus or minus one grade in 85 per cent of cases. Probably, as was found to be true in the case of the comparison of muscle scores, the increased difference represents principally the performance of one nurse. A comparison of the two instructors indicates that their consistency was only slightly better than the physicians. They agreed completely in 66 per cent of cases and within plus or minus one grade in 95 per cent of cases. The results from Trials 3 and 4 indicate a slightly higher degree of consistency in that agreement

Figure 2

RELATIONSHIP BETWEEN MUSCLE SCORE AND PERCENT MUSCLES NOT GRADED AS NORMAL

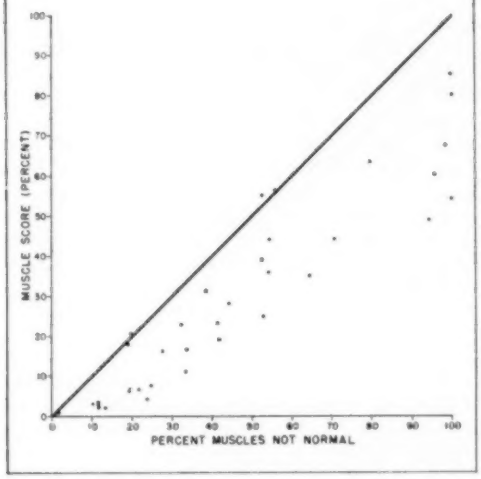
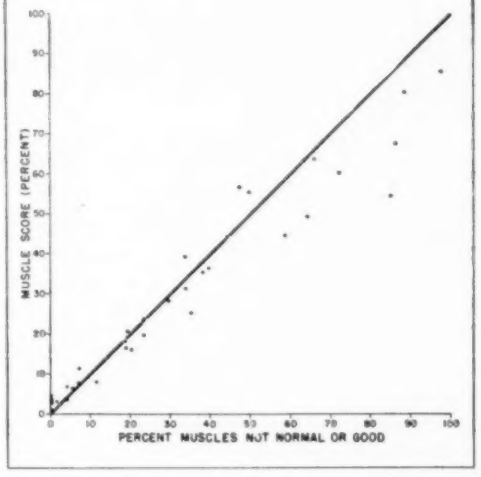


Figure 3

RELATIONSHIP BETWEEN MUSCLE SCORE AND PERCENT MUSCLES NOT GRADED AS NORMAL OR GOOD



was generally achieved in approximately 70 per cent of muscles and within plus or minus one grade in about 96 per cent of muscles. It is possible that this results from the fact that in Trial 1 an entire examination was not performed, but the tests were done on restricted muscle groups.

This comparison essentially substantiates the results found by a comparison of muscle scores in that there is a rather high degree of reproducibility in the examination procedure. In addition, it indicates that most of the variation between two examiners exists within a range of plus or minus one grade.

Some Considerations Concerning Muscle Score

As was mentioned earlier in this report, the use of weighting factors to obtain an index of muscle bulk involved might introduce a biasing effect in the final muscle scores. Even though the muscle score is the result of an averaging process which has certain disadvantages in any analysis, it does have the advantage of providing a summary index of severity, which is a requirement of certain methods of analysis. It was considered necessary to look further into the possible effect of these weighting factors.

This problem was approached by selecting another type of average score based on muscle grades and comparing the muscle score with this new score to see how well they are related. An obvious score can be utilized by merely representing the severity of the case by the percentage of muscles that are not normal, or if one feels that the distinction between normal and good is rather subjective, one can group the normal and good muscles into one category and obtain the percentage of muscles that are not normal or good. The results of the muscle examinations of a group of 36 patients at the D. T. Watson School of Physiatrics were obtained and for each patient, the muscle score, percentage of muscles not normal and percentage of muscles not normal or good were computed. The muscle scores of each patient are compared with each of the other two scores in Figures 2 and 3. These comparisons are limited to the musculature of the neck, trunk, and extremities since the cranial nerve musculature could not be graded in a similar manner.

From these graphs it may be noted that the relationship between the muscle score and the other two scores is rather good. The relationship is somewhat better with the percentage of muscles not normal or good, than with the percentage of muscles not normal. There is a greater degree of scatter in the latter score, which probably

results from the variability of grading good and normal muscles. In general, there is a tendency for the latter two scores to be higher than the muscle score, particularly when the muscle score is high. This probably results from the fact that as more muscles are involved, those muscles with a small bulk have a greater chance of being included. These make a proportionately lesser contribution to the total muscle score than to the scores obtained by merely determining the percentage of muscles not normal or not normal and good.

This relationship was surprising at first, since it indicated that the weighting factors, were not influencing the average score markedly. However, the reason for this becomes apparent when the frequency distributions of the various factors are computed. It was found that out of 68 muscles, 42 are assigned a factor of 1; 12, a factor of 2; 4, a factor of 3; 2, a factor of 4; and 8, a factor of 0.25. A large majority of the muscles have a factor of 1 assigned to them. In view of this, the resultant muscle score is not very different from the other two scores, which are essentially unweighted scores.

In deciding whether or not the muscle score or some unweighted score should be used in any final analysis, account should be taken of the fact that the muscle score represents the muscle bulk involved, which the unweighted scores do not. In addition, the muscle score has an advantage in that it is possible to include cranial nerve musculature within the same averaging process. This is impossible with the unweighted scores.

Discussion

The results of this study appear to indicate that the system of muscle testing used in the Gamma Globulin Evaluation Program has a high degree of reproducibility by different examiners who have received a special orientation in the method used. The reproducibility seems to be better than has been found present in most other types of clinical and laboratory examinations. It is possible that this high degree of reproducibility results from the fact that the categories used in the classification scheme are very broad, so broad as to diminish the sensitivity of the test to a level below which it is not possible to pick up the effect of the agent being tested. On the other hand, it might be argued that if an effect is not disclosed even with the broad categories used, it is not of any importance. These issues obviously can only be decided upon when some actual data are analyzed. An additional consideration that must be taken into account is whether the reproducibility will continue to exist under less optimal field conditions and after varying intervals of time have elapsed since the orientation sessions.

It is also quite apparent from these results and some of the comments made earlier in this report, that in any final analysis it is essential that several different indices be utilized. It is not sufficient to depend upon an average score for making final inferences from the data. The various indices of severity that have been either mentioned or discussed will have to be utilized, since each individual index points up a different facet in the total evaluation of the agent. In addition, each index suffers from different types of disadvantages and therefore, if these various indices yield consistent results, the validity of any inferences is accordingly increased.

Summary and Conclusions

This report deals with certain aspects of the method of muscle testing used in the National Program for the Evaluation of Gamma Globulin in the Prophylaxis of Paralytic Poliomyelitis in 1953. In view of the need for the determination of severity of disease by about 35 physical therapists in the program, it was considered essential to determine the amount of variability that exists between physical therapists. Experimental trials were carried out at the completion of four orientation sessions held for four different groups of physicians, nurses and physical therapists. At these trials, patients were examined independently by three to five different examiners to determine the variability that exists between these examiners. The results of the different examinations were analyzed in three different ways.

A comparison of the absolute differences in muscle scores indicated that the average difference in scores between different examiners was approximately 3 per cent. When the comparisons are analyzed in terms of individual muscle grades, it was found that two examiners agreed completely in the grading of a muscle or muscle group in about 70 per cent of instances, and in about 95 per cent of instances they agreed within plus or minus one grade.

The possibility that the weighting factors that are used to transform the grades into the muscle scores would introduce a bias into the score was investigated. It was found that the muscle score was closely related to unweighted scores, which indicated that no particular bias was introduced. However, since the muscle score represents the

muscle bulk involved, it may be considered preferable to continue to use this index.

Orientation of the participating physical therapists in 1953 was made possible through a grant by the National Foundation for Infantile Paralysis to the American Physical Therapy Association.

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Physical Therapists in 1953 Muscle Testing Program

State	*Physical Therapist for Area*
Alabama	Eleanor Malone
Arkansas	Jean Bailey
California	Georgianna Harmon
	Nina Haugen
Colorado	Eleanor Westcott
Connecticut	Phyllis Johnson
Delaware	Paul O'Connor
District of Columbia	Jean McDermott
Florida	Mabel Parker
Georgia	Eleanor Malone
Idaho	Anna Sweeley
Illinois	Mary A. Gaughan
	Minna Hildebrand
	Myrtle Swanson
Iowa	Jean Bailey
Kansas	Jean Bailey
Kentucky	Irene Coons
	Irene Schaper
Louisiana	Eleanor Malone
Maine	Margaret Arey
Maryland	Elma Lee Georg
Massachusetts	Margaret Arey
Michigan	Sue Brooks
	Esther Hart
	Hildegard Kummer
Minnesota	Alice Chesrow
Missouri	Jean Bailey
Nebraska	Jean Bailey
Nevada	Marion Barfknecht
New York City	Helen Antman
New York State	Louise Hayward
	Edith Nichols
	Winifred Rumsey
North Carolina	Celeste Hayden
North Dakota	Jean Bailey
Ohio	Ruth Pratt
Oklahoma	Mary Rexroad
Oregon	Elizabeth Fellows
Pennsylvania	Mary E. Kolb
	Miriam Jacobs
South Carolina	Celeste Hayden
Tennessee	Deborah Kinsman
Texas	Carmella Gonnella
Utah	Helen Blood
Washington	Carolyn Bowen
Wisconsin	Lillie Bachanz
	Alfaretta Wright

Cooperation with Public Health Nursing During Gamma Globulin Field Studies

In New York State during the Gamma Globulin field studies in 1953 the cooperation between public health nursing and physical therapy was invaluable. The public health nurse's functions were locating patients, arranging clinics, hospital or home visits, and obtaining family physician's permission for the physical therapist who did the muscle testing 50 to 70 days following onset.

The referral cards for muscle testing sent by the Bureau of Epidemiology and Communicable Disease Control in Albany to the Bureau of Public Health Nursing in Albany were relayed to one of the three physical therapists assigned part time to the muscle testing program. At the same time the Bureau of Public Health Nursing notified the Public Health Officer in the area where the patient lived, that the patient was in the study and an appointment would be sent to the Health Officer by the physical therapist for muscle testing 50 to 70 days from onset.

When possible the supervising public health nurse arranged for patients to come to a central location near their homes for muscle testing. These clinics were held in the nursing office of a local hospital.

If the patient was unable to come to clinic or did not keep his appointment, home visits were made. These appointments were made by the public health nurse who had contacted these patients for nursing services and epidemiological data.

Information given by the public health nurse

was helpful, especially where one member of the family had died of polio or when there were emotional situations attributable to the recent severe illness. In a few instances where it seemed indicated, the public health nurse accompanied the physical therapist to the home. If the physical therapist visited alone, information regarding travel directions, telephone number, and name of the head of the household were given by the public health nurse. In the event the patient was in a hospital, convalescent home or other than his own home, the local supervising public health nurse notified the Bureau of Public Health Nursing. If the patient was out of the health district, the physical therapist made the appointment directly with the hospital or convalescent home. Whereas if the patient was in a hospital, convalescent home or other than his own home, but within the health district, the supervising public health nurse arranged the visit.

Before the date of the physical therapist's field visit the supervising nurse sent the schedule of appointments and location of patients. Familiarity with the local area helped her in estimating travel time. Without this local cooperation it would have been impossible for three physical therapists to accomplish the muscle gradings involved in the study of multiple household cases and in the two counties where mass Gamma Globulin injections were given.

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Physical Therapy for Cervical Injuries: A Head Traction Set for Home Use

Martha Schmalenbeck, B.S.

It has been generally known for some time that cervical injuries or irritations provide an important area for physical therapy. Perhaps, however, there has been insufficient emphasis both on the scope of these therapeutic measures and on the problems accruing to the patient who must undergo a long period of correction, usually involving traction appliances. Records in the Department of Physical Medicine of the Scott and White Clinic show that in the period July to December 1953, 19 per cent of all physical treatments prescribed were for cervical injuries and strains. Some of these patients had acute conditions necessitating hospitalization; others were outpatients from the beginning. Nearly all needed prolonged, continuing treatments involving traction and corrective exercises — a pressing problem for those living in areas where a physical therapist's services are not readily available. This discussion is a resumé of the conditions necessitating such therapy, the kind of treatment provided, and a description of a head traction set designed to fill the need of the patient for home use during the long corrective period.

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The types of patients referred to the physical therapist by the doctors of the Scott and White Clinic for cervical treatment include:

1. *Whiplash injuries.*
   This is a type of injury to the cervical spine which occurs to the driver and passengers of an automobile struck from the rear by another car. The passenger's neck is forcibly flexed and extended by the impact. The resulting injury may be mild to severe, appearing immediately or within several weeks after the accident. This is said by some to be, at least in part, a cervical root irritation with referred pain into the head, shoulders, arms or thoracic region. (Gay, Abbott, and Davis)
2. *Degenerative changes in the cervical vertebrae.*
   These may be of osteoarthritic or traumatic arthritic origin. In some of these patients

there is a reversal of the normal cervical curve, and/or lipping or roughening of the bodies of the vertebrae. Again, there is cervical root irritation resulting in pain in the upper extremities, head or chest. (Overton)

3. *Muscular and ligamentous strain.*

   This injury may be caused by poor posture over a long period of time or as a result of certain occupations. In this type of cervical strain the head is usually thrust forward with the chin actually tilting upward in relation to the neck. There is usually accompanying kyphosis and increased lordosis. (Cave)

4. *Head and neck pain of cervical disk origin.*

   This injury is generally unilateral, resulting in the compression or irritation of one or more cervical nerves at the site of the protruding disk. The pain is frequently acute on motion in the shoulder, arm, hand, or the area supplied by the cervical nerve. (Schultz and Semmes; Spurling and Segenberg)

5. *Headaches associated with the above mentioned injuries.*

   These usually start at the base of the neck and travel up and around toward the face. The posterior neck muscles are tight and the patient is unable to relax.

The patient who is being treated for an acute cervical condition may be hospitalized by his physician for from two to seven days for instruction or definitive care, and while so hospitalized he is placed in horizontal head traction for as many hours per day as he can tolerate. The usual procedure is to have him wear the traction 45 minutes and rest 15 minutes during each of the 24-hour period. He is not allowed to sit or walk during this time and receives two physical therapy treatments each day; these consist of moist heat, traction, massage to the cervical region, and neck exercises.

The patient with the less acute cervical irritation is treated as an outpatient. He receives one or several treatments in the Physical Medicine Department, and is fitted with a head traction set and instructed in its use at home.

A simple head traction set for home use has been designed and assembled in the Scott and White Department of Physical Medicine and is distributed to the patient by prescription from his physician. It is a compact set composed of all the essential parts including a head halter, spreader bar, adjustable bar holding the pulley, rope and weight bag. The set has a sheet of instructions for home use, an exercise sheet for the muscles of the neck, and proper posture suggestions to avoid cervical strain. The instruction sheet includes a drawing of the assembly as it should be set up at home (See figure 1).

It is pointed out to the patient that for best results from the traction, the body must be comfortable and relaxed so that the tight muscles of the posterior neck may be stretched. A firm bed is recommended and he is instructed to provide a pillow under the thighs, to place some form of heat or a rolled towel under the neck, and to use a well fitting head halter. If the halter is not comfortable or does not fit well, the patient is unable to relax, therefore special care is used in fitting the halter to the individual patient. The halter may be lined with foam rubber for greater comfort. The spreader bar is placed on the halter and the weight, five to ten pounds, is lifted from the floor by means of a pulley. The chair attachment with the bar for holding the pulley is adjustable in height. The angle of pull of the weight is probably the most important factor in obtaining good cervical traction. First, it should be comfortable and second, it should come from the occiput, not from the mandible. In fact, there should be no pressure at all on the point of the chin. The angle of pull, therefore, should be approximately 45 degrees.

The patient is instructed to use the traction at home three times daily for about 30 minutes and to learn to sleep in it at night for several hours at a time. When heat is applied to the cervical region, it should be mild heat for no longer than 30 minutes at a time.

The exercises for the neck muscles include flexion, rotation, lateral bending, and extension of the cervical spine. The exercises are taught to the patient in either a lying or sitting position, and he is cautioned to avoid hyperextension at the axio-atlas joint.

Posture suggestions to discourage future or continued irritations of the neck include sleeping, sitting, and standing posture as well as a few suggestions of activities to be avoided by patients with cervical pain. Such activities as reading, sewing, driving, and watching TV are discussed with the patient and the normal relation of the head, neck, and shoulders to the rest of the body is pointed out. Reading in bed is discouraged. Proper posture for the entire body is emphasized since it is impossible to alter one curve in the spine without altering another. In the event the patient had increased lordosis, there generally follows increased strain on the cervical area. An

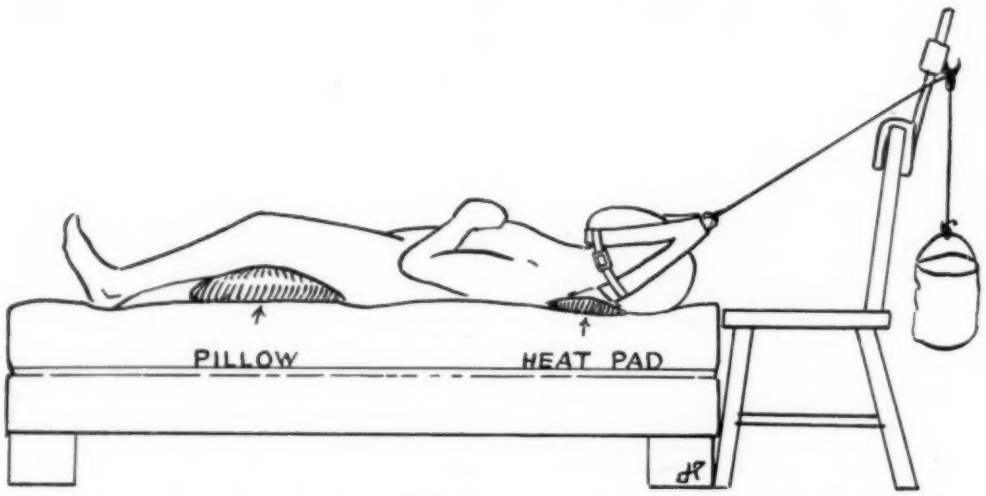

Figure 1 shows patient lying on firm bed, with pillow under knees, and heat or support under neck. The angle of pull of the weight is approximately 45 degrees.

example of poor standing posture with kyphosis and a forward head is the housewife who leans on the sink to wash dishes, bracing herself with her abdominal region. It follows that the lumbar curve is increased, her head is tilted forward and upward to compensate, and the strain is in the posterior cervical region. Prone sleeping is to be avoided as well as using a large pillow in the supine position. A small support at the base of the neck is encouraged for this position, while the use of a pillow in the side-lying position is recommended.

Thus, by means of a comfortable and efficient head traction set, which the patient can use in his home, together with instruction in corrective and preventive exercises and posture, good results have been obtained at relatively little cost to the patient.

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Physical Therapists' Problems in Chronic Illness

James E. Griffin, M.A.

This paper is primarily a reflective study of daily problems which must be faced by the physical therapist in handling disabilities which cannot be overcome in a short period of time. It is recognized by the author that his own personality and modifications therein, due to a cerebrovascular accident which occurred some 28 years ago, will influence context and vocabulary, perhaps more than if this were a purely objective paper annotated by authority and reinforced by laboratory study.

The observations are based on a personal knowledge of approximately 1,500 admissions and readmissions at the Veterans Home and Hospital, Rocky Hill, Connecticut. Cerebrovascular accidents, peripheral vascular diseases with and without amputation, orthopedic disabilities, and central nervous system dysfunctions make up the bulk of the admissions. It is entirely an inpatient hospital, for male patients.

The problems with which the physical therapist must be concerned fall into two major categories. First, personality imbalance caused by or accentuated by a drastic enforced change in way of life; second, the problems of physical training to adapt the residual functioning neuromuscular units to their greatest efficiency. The problems are placed in this order to emphasize the fact that the patient must want to get well before there will be significant improvement.

In considering loss of voluntary motor control and its effects on personality, it may be wise to divide the patients into two groups: those whose disability stems from disease of sudden onset or from physical trauma, and those whose disability arises from chronic disease. In the former group disability is not likely to get worse with time. Loss of motor control due to chronic disease, on the other hand, is of gradual onset and may become more severe, especially if pathology cannot be kept under control by the available medical services. This basis for distinction between the two types of onset and course leads to some differentiation in personality change.

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In cases of sudden onset one must realize that there may be mental as well as physical shock. If the patient is to survive physically, the course of the physical shock will have been slowed, stopped and reversed in a relatively brief period of time. The mental shock, on the other hand, does not respond to medication. It does become modified as the person evaluates his disability in his own way and catalogues it as a facet of his personality. Depending upon personality prior to onset of disability, the disability may become:

1. THE dominant factor in life
2. *A* dominant factor in life
3. a minor factor
4. completely ignored

regardless of the extent of organic damage. If it persists as THE dominant factor the personality is likely to become imbalanced, perhaps to the extent of requiring residence in a mental hospital. The person who completely ignores the disability may be equally imbalanced. Whether the residual of the physical damage becomes a dominant or minor factor may depend upon the amount of loss of function and the possible circumvention of that loss through adaptation.

It is understandable that a person who has had full use of an obedient body and who suddenly loses all or part of that use is going to be apprehensive as to his future. Assuming that the physician can adequately reassure the patient that he is not going to die, it is then up to the patient to decide whether or not he is going to work with the rehabilitation team to regain as much use of his body as is compatible with irreversible pathology. Most patients will willingly make this fight for a while. But, if progress is slow and minimal, over a period of time one naturally becomes discouraged, perhaps becoming even more apprehensive than during the immediate post-traumatic period. If a person gives up the fight to regain the use of his body and resigns himself to permanent and complete dependence on others for his existence he may be regarded as having never recovered from his mental shock. This is understandable where loss of function is great and irreversible. It is

understandable also where the lesion has caused mental deterioration. But, this feeling of discouragement should not dominate where loss of function is not so great as to prevent independent ambulation. Yet far more persons use a relatively minor physical disability as a reason for permanent dependence than do those with massive physical loss. It is the latter who appear to have abnormal personalities.

The patient whose motor dysfunction is caused by disease usually will have more time available for fitting his disability into his living pattern. But, at the same time, the real or imagined continued deterioration in physical independence may require more adjustment of psychic forces than the person is capable of making. Assuming the physician has seen fit to inform the patient of his prognosis, he will either accept it and adjust his living pattern accordingly or he will seek other medical and nonmedical advice until he hears a prognosis he can accept, or he may ignore the prognosis until advancing pathology forces him to face the facts. Discouragement and tendency towards dependency in regard to the activities of daily living will be aggravated by the gradually increasing loss of voluntary motor control and concomitantly increasing economic and social deactivation. If the person who is thus disabled has a mature personality he will accept this, and plan accordingly. The chief difference then between acute or traumatic and chronic incapacitation is that the mental shock is of lesser degree but of longer standing in the latter situation.

Whether the loss of voluntary motor control be due to trauma or disease, perhaps the most outstanding personality change is the great increase in the feeling of frustration. Frustration may be thought of as the prevention of an action which if carried out would represent the gratification of a desire. The feeling of frustration comes to some because the body is no longer an obedient servant; to others on realization that memory and judgment are impaired, as well as the body. Individual reaction to frustration will vary in expression, but, results more often than not in aggression. Aggression may be toward external objects or people, or may be mainly turned inward, leading to intense internal conflict. The latter may lead to periods of depression and/or agitation, although usually not severe enough to require professional psychiatric attention. The physical set-up of a hospital does not permit outward physical aggression; hence, the patient often responds to his disability frustration by passive cooperation, by flat refusal to even attempt to follow instruction, or by voicing vitriolic resentment against everyone. Yet, in his more lucid moments he is fully aware that the rehabilitation team is trying to speed recovery. Often the rebellion is directed against those who work with him most. Particularly it is against those who are trying to help him relearn the activities of daily living—that is to say, the physical and occupational therapists.

The patient is apt to find that lack of independence in these activities is especially frustrating in as much as they were once automatic. It might be slightly analogous to imagine your own reactions if you are used to driving across town to see a friend, and have always enjoyed the drive and the visit. One day you find traffic so heavy that for an indefinite period you have to devote full attention to your driving, and even then run considerable risk of not arriving at your destination safe and sound. The chances are that on arrival you are somewhat more short of temper than usual and perhaps have a sudden feeling of tiredness. If this traffic situation were to become permanent you might seek a new route; avoid going unless absolutely necessary; or, accept it and realize that you might just as well get used to it. So it is with the person who must expend considerable mental and physical effort doing tasks which were once automatic and trivial. The physically handicapped person, who was mature and reasonably content prior to onset of disability, will accept the fact that he now must concentrate on these activities and be willing to learn how he may do this most efficiently.

Concurrently or following the rising tide of frustration may come fear. Fear may be delineated as a painful emotion, marked by alarm or dread. Fear may arise from a feeling of guilt, as when the patient regards his disability as punishment for his sins. Such a situation often occurs if the patient has ignored strong authoritarian objections to a given activity, and then has become ill or injured shortly thereafter. When this is the case he is not likely to put much interest or effort into getting well.

There also may be the fear that any attempt at activity will lead to further injury. This may come from insight, from other patients, or from well meaning but overly pessimistic medical personnel. Whatever the source, fear may be just as great a deterrent to rehabilitation as the organic lesion. The accepted way to overcome fear of further injury is to break down the requisite activities into little units which the patient may practice until he is satisfied that they are safe. This is likely to be tremendously time consuming

on the part of the therapist and the patient but, if by considerable practice self confidence is established, it is time well spent.

There are two factors of environmental origin which may have considerable influence upon the will to be rehabilitated; first, what is colloquially known as "hospitalitis," and second, over solicitous relatives. "Hospitalitis" may be thought of as a personality need for a sheltered rather than a competitive environment. The chronically ill patient may not realize this preference until he has reached the stage where he is allowed to spend an occasional week-end at home. At this time he may become abruptly aware that once again he has decisions to make, services to perform for others, and other persons on his organizational level to consider in his activities of daily living. After a few months' vacation from such thought provoking activities in a place where as long as he followed orders life was peaceful and all was provided, it may come as a rude shock that someone thinks of him as a person first and patient second or not at all. If this shock is severe enough and requires distinct removal from peaceful mental ruts he may welcome return to the institution because of personality needs. If successive outside visits bring about simliar surprises, in a brief time the protective environment may seem home.

In contrast to conditions which result in "hospitalitis" are the visits home, where everything is done for rather than by the disabled person, regardless of any progress which he may have made. If the relatives cannot appreciate the fact that even the most severely disabled can do and should do some things for himself, the patient may wonder why he should make the effort. Sometimes relatives are overly helpful simply to save time. Sometimes they feel that if a person is sick enough to require hospitalization he should do nothing for himself. Both of these are understandable attitudes but both are also hinderances toward the goal of independence. Both usually can be set aright by the indoctrination of relatives in the need for having the patient do as much for himself as possible for his own good. This indoctrination should be done before the first home visit by the physician in charge of the case, if possible.

Occasionally there is another reason why relatives do more than is necessary for the patient. This occurs in cases where relatives abhor physical disability in any form. Consciously or unconsciously they are most uncomfortable in the presence of sickness, especially if it may mean a permanent loss of function. Knowing this, they make every effort to proffer complete assistance. This is an unfortunate situation which is not readily corrected by indoctrination and may require the services of a psychiatrist.

That these factors are major problems in dealing with physical rehabilitation of the handicapped are borne out by two studies which are summarized below:

> A study of the problems of chronic illness in England, published in 1950, discloses that the most critical time is approximately 100 days after the onset of disability or admission to the hospital. According to the authors the attendant medical problems will have been solved by this time or controlled as nearly as possible; whatever rehabilitative measures are indicated will have been instituted; and the patient started on a program which it is hoped will result in his ability to care for himself. However, long before the doctor is sure the patient will live or die there may be a subtle disintegration of personality, and the wish to die quietly may present itself. These findings were based on a detailed study of over 1,000 cases having a mean age of 75.
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> A sociometric study of personality in chronic illness, based on 100 consecutive admissions in a general hospital, showed *on admission* 45 patients to be in an anxiety state and another 46 to have an inadequate personality. Thus, 91 out of 100 consecutive admissions, unselected in any way, had personality imbalance to a sufficient degree to be included among the primary diagnoses *by an internist*, not a psychiatrist. This was in a hospital which transfers all psychotic patients to a mental institution. S. P. Seigler, author of the study, concluded "the inadequates are already chronically disabled: the patients with anxiety pose a problem in the prevention of chronic disability." He further stated, "almost all the patients were more disabled than their organic disease or somatic complaints would seem to warrant." *Of these 100 admissions 97 were under 50 years of age.*

Frustration and fear are part of all persons' reactions to circumstances. "Hospitalitis" and oversolicitous relatives are problems which all of us may have to face sooner or later. Only when they dominate or obliterate all other possible reactions to physical disability do they comprise personality imbalance and become major handicaps to rehabilitation. When one requires medical care, whether in or out of a hospital, there is normally a strong desire to get well. Fear,

frustration, "hospitalitis," and oversolicitousness, as described here, inhibit that normal desire.

Chronic illness also presents problems in physical treatment, problems which a physical therapist must accept and understand if he is to derive satisfaction from his work. The most easily understood of these is that the patient is likely to have several things wrong, some acute and some chronic, each incapacitating to a greater or lesser degree, and is perhaps more prone to acute illness than is a normal person because of relative lack of physical activity and consequent more rapid physiological aging. Delays in rehabilitation brought on by acute conditions cause delay or regression in attempts to achieve independence.

What training and what definitive treatments are necessary for the patient in order to achieve independence can be determined by a quantitative estimate of ability for self care. This can be measured by physical and occupational therapists through use of a standardized test, i.e., an *Activities of Daily Living Test* for each admission to the department. Ideally the test is given prior to any treatment, and repeated at regular intervals until a lengthy plateau period indicates that rehabilitation has proceeded as far as possible. The test's major divisions might be:

1) bed activities
2) hygiene
3) eating
4) dressing
5) utilities
6) communications
7) use of wheelchair
8) apparatus required
9) use of bathroom
10) standing, walking, and elevation

In accordance with the findings of the test, the patient should be instructed in and allowed to practice the best means to overcome his deficiency. If joint limitation, muscle weakness, or pain are factors limiting independence, it will show on such a test, following which more precise measurements may be taken, thus making it easier for the physician to evaluate the total disability. The same holds true when nerve or cardiovascular lesions are contributing causes to disability. The physician needs all of this information if he is to write the best possible prescription for rehabilitation. An *Activities of Daily Living Test* tells in large part in what areas of physical management the patient is handicapped. The other tests tell why and how much.

There are two other major problems which concern physical therapists working with the chronically ill. While often seen together in the same patient, one may be present without the other, namely, brain damage, and muscle spasm of central nervous system origin. In no sense does the physical therapist ever achieve cure of such dysfunction, but despite this he and the patient must work to adjust to this and circumvent it.

It is well to recall two facts applicable to all central nervous system lesions: (1) that where conduction pathways have been destroyed there is no regeneration and (2) that there is a great mass of reserve pathways which normally are not in use, but which may be brought into use through training. In brain damage, i.e., the cerebrovascular accidents, there are often, in addition to the destruction of certain motor pathways, sequalae of confusion, inadequate communication, and inability to remember instruction. Unless the lesion is spreading rapidly, repetition of an activity day after day appears an effective way of enabling patients with brain damage to eventually remember how to do a given task.

The virtues of repetitive exercise are well known to physical therapists. It has long been used in muscle reeducation necessitated by lower motor neuron damage, and in functional training of the cerebral palsied. Just as repetition has been known to be an excellent strengthener of weak muscles and a satisfactory method for teaching coordination, so it has been shown that attempts at turning over in bed, and attempts at dressing, also respond to repetition. Often a patient may remain on a plateau for several months and then within the space of several days make marked progress; or, there may be some days when the patient follows instruction easily, whereas on others he appears to have never learned a thing. But, by and large, even with extensive brain damage, if an activity is broken down into small enough phases, eventually a way can be found to make the patient less dependent upon others for his daily care. That is the goal, of course, of all medical and auxilliary personnel.

There is as yet no satisfactory answer to the management of muscle spasm of central nervous system origin. There are certain physical therapy procedures which will sometimes give temporary relief so that joint range of motion may be maintained and ambulation may be attempted. Heat in some form, with moist heat perhaps being the most efficacious, is frequently used, with note being made of sensory impairment. Its effectiveness is apt to be temporary and of value only in allowing greater manual stretching. Various low frequency currents have been used, singly and in combination, by means of pad electrodes and in hydro-electric baths; in

either case the current is concentrated on the muscles which are in spasm. Such treatment may have a cumulative effect, building up gradually from one treatment to the next, with spasm and pain relief lasting a little longer after each treatment. Certainly in part such results are due to counter irritation, and also to fatigue. There are undoubtedly other reasons for this relief which are not yet understood.

It becomes apparent then that although the physical therapist must treat patients whose disabilities are of such major proportions that little can be done for them, he must continue in his efforts to help them achieve independence. The chronically disabled may have several reasons for being incapacitated; brain damage, and spasticity may be present. All are factors which may hinder the physical rehabilitation of the patient, but, as important as they sometimes are, none is as important as the psychological and environmental factors which determine the patient's will to get well.

SUMMARY

1. Problems facing the physical therapists who work with patients who have disabilities which require a long time to overcome are discussed.

2. The psychological factors discussed are:
   a) frustration
   b) fear

3. The environmental factors discussed are:
   a) "hospitalitis"
   b) oversolicitous relatives

4. The physical factors discussed are:
   a) the over-all goal of physical therapy which should be the teaching of the patient to become independent in his activities of daily living
   b) that such patients are likely to have several dysfunctions, some acute, some chronic
   c) brain damage and spasm of central nervous system origin, with sequelae are conditions which are frequently seen but for which relatively little can be done, as yet.

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DISCUSSION by Dr. Nila K. Covalt, physiatrist, formerly Chief of Physical Medicine and Rehabilitation at the Connecticut Veterans Home and Hospital, Rocky Hill, Conn.

The author has emphasized the basic emotional problems which tend to hinder or even prevent an individual from becoming physically independent within the limits of his remaining residual physical capabilities. Most therapists are aware at least subconsciously of these emotional undercurrents. However, the more conscious knowledge a therapist has generally, on the mechanisms of emotional reactions, the better able he is to assist each patient to progress in learning and accepting physical independence. The more a therapist knows about each patient's emotional pattern and the underlying psycho-social relationships which have contributed to his emotional reactions, the more opportunity the therapist has to assist each patient to make his individual gains, physically and emotionally. Every physician and all ancillary personnel who work with patients use psychotherapy in one form or another as they work with each patient. Every patient with any chronic disease or disability will have emotional adjustments to make. Psychiatrists are not always available for every patient, but when a psychiatrist does interview a patient he usually readily interprets the emotional pattern and its causes. Psychotherapy may or may not be indicated, but the interpretation itself is often a clue to a therapist as a mode of approach in treating a particular patient. This in itself can be one phase of preventive medicine.

The acceptance of disability, the adjustment to changes in body image, the reactions due to attainment or striving for secondary gains must be repeatedly and continuously considered. The author has stressed that frustration and fear are two basic psychological factors which cause patients to react in various ways. Training in activities of daily living is often hindered by emotional problems which frustrate both patient and therapist. Physical independence makes for self respect even when vocational goals are not feasible or possible. The author is to be congratulated for his timely paper to stress these problems.

DISCUSSION by Dr. Louis Sussman, Instructor in Psychiatry at the Functional Clinic of the Graduate Hospital of the University of Pennsylvania; Assistant Attending Chief at the Philadelphia Psychiatric Hospital; and Assistant Attending Physician, Neurological Service, Philadelphia General Hospital.

The author rightly acknowledges the concomitant existence of psychological factors along with physical disabilities and touches upon some cogent psychological considerations associated with their successful execution of physical therapy.

Physical impairment of accustomed functions, whether acute or chronic, invariably produces psychic repercussions. The amount of psychic irradiation from the physical impairment and the ultimate involvement in personality integration, adjustment capacity, and motivation, is dependent upon the dynamic interplay of mental mechanisms or defenses (rationalization, compensation, denial, repression, regression, acting out of hostility, reaction formation and body image factors), and value systems which characterized the stricken individual in

his pre-illness status. These may be manifested by varying degrees of psychic disturbance which may run the gamut from simple reactive or situational maladjustment through neurotic or psychotic behavior, transient or chronic in character. The ultimate outcome depends upon the nature of the physical insult, whether it is a peripheral (neurosomatic) or central (psychosomatic) involvement, the personality structure and its degree of maturity, stability, realistic motivation, personal values, and achievement goals. The whole process is facilitated or complicated by the maturity, objectivity, and insight of the various rehabilitative agents.

To the extent that the patient is regarded as a total organism, a body-mind unity, influenced by internal and external environmental factors and pressures, and to the extent that the psychosocial conditions of the patient's life are known and understood, the physical therapist and all the other rehabilitative agents can perform rational physical therapy which is realistically and maximally rehabilitative. The over-all understanding of the patient as a person with characteristic modalities of feeling, thinking, and acting, operating in a regressive or defensive manner under a particular stress or stresses, will increase the physical therapist's interest in the patient beyond his isolated mechanical manipulation and stimulation of organs and instruction in use of devices, as well as increase the success in the rehabilitation of the disabled patient.

The greater the grasp of the psychological implications associated with a physical disability the more tolerantly, sympathetically, and realistically will the individual physical therapist be able to cope with otherwise frustrating irrationalities and loss of motivation for sustained interest and participation in a program of rehabilitation. The physical therapist who is psychologically oriented is alerted, and through objective observation and sympathetic listening is able to gain valuable psychic insight into his patient. He will be in a position to prevent and remove emotional blocks in relation to his rehabilitative efforts through rectifying distortions in thinking, feeling, and behavior and to fortify himself against becoming threatened, insecure, defensive, or rejective of the displaced hostility or other neurotic acting out of the patient. Thus, through the objective understanding of the patient as a person, with induced personality decompensation stemming from a traumatic situation, and a knowledge of iatrogenic factors (the therapist's provocation or enhancement of maladjustment in the patient through ministrations, gestures, attitudes, or words which the patient misconstrues), the therapist can stimulate and inspire the healthy reintegration of the disturbed soma and psyche which could not be achieved by relatively impersonal mechanical manipulations. Where psychological blocks are encountered, nullifying the therapist's best efforts, team collaboration and consultation with social service and/or psychiatric colleagues are in order—from which enlightened perspective may be gained and movement facilitated.

The author might have included some case histories illustrating some of the psychological factors and how they were managed. However, his efforts in behalf of emphasizing the psychological implications of physical disability are praiseworthy and indicative of a swing to rational and comprehensive physical therapy. The author's psychological generalizations, as far as he has gone, are valid and useful in understanding why some patients will not respond to rehabilitative measures. It should be emphasized that each person will have to be understood on the basis of his own psychodynamics, personality structure, value system, and environmental setting.

"Four Futures" Describes Careers in Four Professions

The American Physical Therapy Association has participated in a unique venture of cooperation between professional associations and the military which has resulted in a publication titled "Four Futures" released for distribution by the Department of Defense.

Under the guidance of Mrs. Nelson A. Rockefeller, who serves on the Defense Advisory Committee on Women in the Services appointed by Secretary of Defense Charles E. Wilson, the opportunity was defined in simple terms. The long-range needs of both civilian institutions and military hospitals for professional nurses, dietitians, occupational and physical therapists could be met only if the over-all supply could be increased substantially. The Department of Defense, therefore, decided that a contribution could be made in this area by preparing information materials addressed to the young girl in school who is about to choose her future career and to make such materials available to guidance teachers.

The American Nurses' Association, Committee on Careers of the National League for Nursing, American Dietetics Association, American Physical Therapy Association, and American Occupational Therapy Association were invited by Mrs. Rockefeller and the Defense Department to work on the project. All association representatives were active participants in providing research, editorial guidance, and policy.

"Four Futures," the final publication, combines information about the four professions indicated in an attractive format with appeal for teen-agers. The booklet will be distributed to all secondary schools by the Defense Department. Each Association has been supplied with copies for distribution.

A Tilt Table Device for Home Use

Morris Vogel, B.S., and Lawrence Weinstein, B.S.

Recent evidence has clearly established the need and value of early and continued weight bearing in the management of the chronic neurological patient. Dr. Arthur S. Abramson, in his studies on the effect of prolonged non-weight bearing in patients with spinal cord injuries, pointed out that osteoporosis due to inadequate longitudinal bone stress is almost inevitable. He further states that the same is probably true in the primary myopathies such as muscular dystrophy. It has been noted by other competent observers (Deitrich et al.) that severely disabled patients of all types, and even normal persons who for one reason or another have been confined to bed in recumbent positions for extended periods of time, have difficulty in making the transition from the completely recumbent position to the sitting or upright position. Besides the danger of osteoporosis, which is often associated with the formation of urinary stones, the incidence of phlebothrombosis has been reported high in patients where motivation toward weight bearing was poor. From the patient's point of view, dizziness and a feeling of extreme weakness are commonly experienced when sudden changes in posture are instituted. This discomfort may be partially eliminated by an early and gradual assumption of the upright position.

Morris Vogel, Chief Physical Therapy; Lawrence Weinstein, Assistant Chief Physical Therapy; Physical Medicine Rehabilitation Service, Veterans Administration Hospital, Bronx, New York.

In institutional rehabilitation of patients with prolonged illnesses, tilt table therapy is started very early following the acute stage of the disease. It is integrated with the entire rehabilitation program and precedes weight bearing with braces and pre-ambulation exercises between parallel bars. Experience has clearly demonstrated that those patients who are started early on tilt table therapy, usually progress more rapidly in their rehabilitation objectives because of a lower incidence of complications.

A standard commercially manufactured tilt table costs approximately $200.00 and requires a good sized area for storage purposes. Obviously, such a device is not feasible for the average patient in his home environment. The authors have devised a modified tilt table to meet the needs of home bound muscular dystrophy patients and have successfully instituted this device in

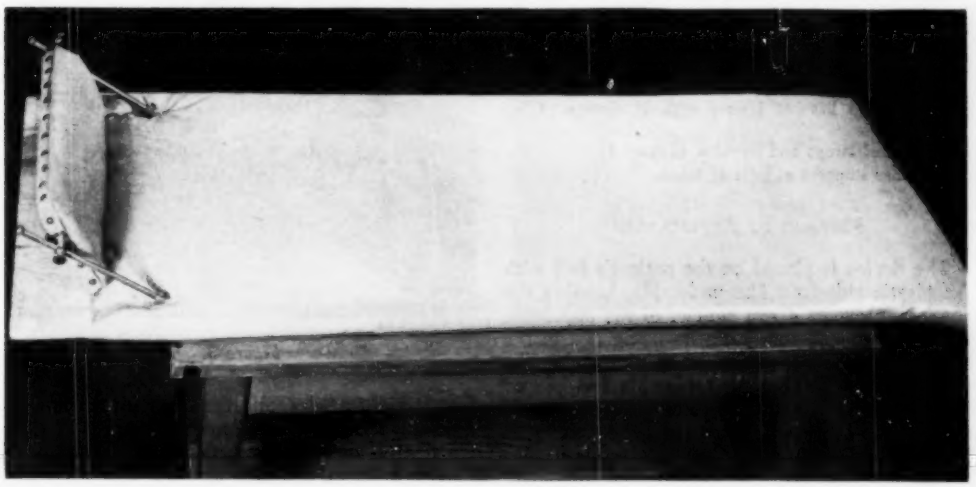

Figure 1.

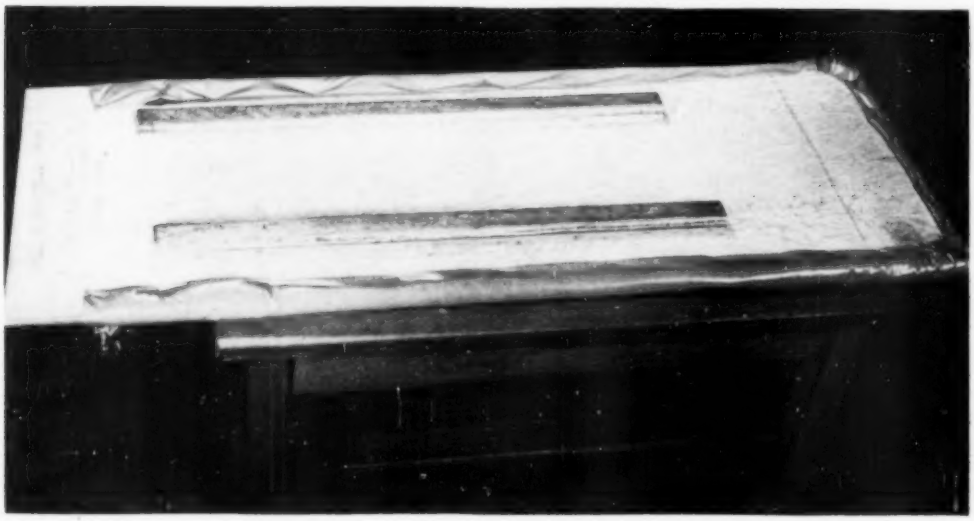

Figure 2.

several homes with the cooperation of the families, at a cost of approximately $9.00.

The following is a description of the tilt table and the materials necessary for its construction:

A. ¾" plywood — 6 ft. long, 30" wide, padded with cotton felt and covered with plastic material. (Figure 1)
B. ¾" plywood footboard, 15" x 7", attached by hinges 5" from base of the table. (Figure 1)
C. 2 strips 2" plywood with rounded corners 40" x 3" on back of table, 4" in from either side. (Figure 2)
D. 2 stop hinges attached to table and connected to footboard. (Figure 1)
E. 6 plywood bracket inserts with U clamps. (Figure 3)
F. 3 padded straps and buckles. (Figure 3)
G. Rubber stoppers at base of table.

METHOD OF APPLICATION

The device is placed on the patient's bed with the plastic side up. The underside, housing the runners, prevents direct contact of the apparatus with the bed and facilitates its being slid to the desired position at the side of the bed. The patient is put on the tilt table, his feet placed firmly in contact with the foot rest — the angle of which is adjustable by means of the stop hinges. The purpose of this footboard is to permit its adjustment to the angle coinciding with the foot drop contracture, if present. It also acts as a method of manipulating and maintaining the

Figure 3.

feet at right angles, and thus has the additional advantage of stretching contractures which are frequently present in patients with muscular dystrophy or other disabling disorders.

After the patient is in position, the brackets are inserted and their straps are fastened across the

patient. The placement of the brackets and straps will depend on the height and condition of the patient and should be so arranged as to secure the body at three key levels, namely, across the chest, upper portion of the thighs, and the knees. This arrangement may be varied from patient to patient depending on the individual case, taking into consideration the presence of contractures, spasticity or tightness at the hips and knees. The table is then ready to be slid over the side of the bed at the desired angle (Figure 4). Slipping of the device, when it is in contact with the floor, is prevented by the two or more rubber stops at the base of the apparatus.

The degree of angulation and length of each treatment is dependent on such factors as the pathology involved, the period of recumbency, and the general physical stamina of the patient. The usual initial treatment lasts 20 minutes at an angle of 30 degrees. The treatment is repeated once or twice every day and the rate of progression in time and angulation must necessarily depend on the patient's reactions to the therapy.

SUMMARY

This tilt table device is ideally suited for home use by virtue of its inexpensive construction and suitability for easy storage. It is relatively easy and safe to use by any member of the patient's family. In addition to its therapeutic value as a weight bearing device, the tilt table has definite value in stretching contractures and is suitable for use as an exercise plinth when placed on a bed, since it eliminates the usual sagging encountered on the average mattress.

BIBLIOGRAPHY

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3. Deitrich, J. E., Whedon, G. D. and Shorr, E.: Effects of Immobilization upon Various Metabolic and Physiologic Functions of Normal Men. American Journal of Medicine 4:3-36, 1948.
4. Abramson, A. S. and Ebel, A.: Rehabilitation in the Management of Prolonged Illness. The Medical Clinics of North America, Vol. 37, No. 3, 915-932, May 1953.

Photographs of the modified tilt table have been used through the cooperation and with the permission of the Veterans Administration Hospital, Bronx, New York.

Figure 4.

Editorials

WHEN any discipline attains professional status through the efforts and achievements of its own members it can expect to realize many advantages and rewards. Both the tangible and intangible returns will affect each individual directly as well as add to the strength of the group. This has been clearly demonstrated in the field of physical therapy during the past quarter century and it is why today we enjoy the prestige and sense of accomplishment that comes from being members of a soundly based profession.

The acceptance of these many advantages, however, should bring a deep realization of the responsibilities which professional status demands. These fall basically into three important categories. First, there must be an understanding and appreciation of the fact that much hard work and unselfish effort were necessary to accomplish the task. Second, it must be clear that what has been done can be maintained only through constant activity; and third, there should be a realization that progress must be continued on a sound and realistic basis.

It is unfortunate perhaps, but true, that each of us easily falls into the habit of taking for granted what we already possess forgetting that it did not always exist. The attainment of professional status for the physical therapist required long and undeviating vigilance on the part of a handful of far-sighted and dedicated individuals who formed and have maintained the American Physical Therapy Association as the professional organization to foster and develop physical therapy service and physical therapy education as the recognized obligation of a profession to the public interest. To lose sight of this fact would deny the very foundations which today provide us with our acknowledged prestige and position.

It is not enough to be appreciative of the start which has been made, for no matter how sound and well planned a program may be, it must be reviewed, evaluated, and reorganized constantly to keep pace with an expanding concept. Every new member of any profession should be aware of his responsibility in this area. The fact that a goal has been reached does not guarantee that it will be maintained without active participation by everyone concerned. In the field of physical therapy there is little room for the person who enjoys the rewards but feels no need to help attain them.

It is important, then, for each of us to realize that what we enjoy today did not always exist and that, without our constant effort, may cease to exist. Of even greater importance is the realization that it is our duty to play an active and dynamic part in the future growth and development. Our profession can exist as long as it progresses and such advancement must result from a combined and integrated interest on the part of each of us to develop our professional consciousness and to support by active participation our professional association. It is not enough, to accept and be proud of our present status. We must each ask ourselves what we have contributed to the present and the future of physical therapy — a proud profession.

Association Activities

Florence Amy West, a member of the Association from 1921 until 1953, passed away in Tacoma, Washington, on February 7, 1954. Miss West was employed at the Pierce County Hospital in Tacoma from 1929 until she retired in 1941.

CHAPTER NEWS

Pennsylvania

At the annual meeting of the Pennsylvania Therapy Association, Inc. held on April 8, 1954 there was an outstanding group of members — four charter members of our Association, which was in existence before the American Physical Therapy Association was founded, and two of those members who are life members of the APTA. They were Mary Rockhill and Elizabeth Aikens, both life members of APTA and Agnes Lea and Louise Jetter, charter members of our chapter.

Few chapters can boast of such a distinguished group of really loyal members for all those years! The Chapter is proud of them all.

Texas

Six officers from Brooke Army Medical Center, Fort Sam Houston, spoke at a convention of the Texas chapter of the American Physical Therapy Association in San Antonio, April 30 to May 2.

Twenty-five physical therapists and students from Brooke Army Hospital and Medical Field Service School attended the conclave, which was directed by Captain Frances M. Davison of Brooke, chairman of the state association's Central Section.

Speakers included Captain Mary K. Berteling, occupational therapist at Brooke Army Hospital; Captain David Rubin, physiatrist at Brooke; Major James O'Donnell, Brooke Army Hospital orthopedist; Captain Jerold Becker of Surgical Research Unit at the medical center; Captain Mildred Anderson, physical therapist at Brooke Army Hospital; and Major James W. Layman, an instructor in the neuropsychiatry branch of Medical Field Service School.

About 100 delegates were registered at the Plaza Hotel. Professional meetings took place Saturday, and a banquet was held Saturday night. The association's business meeting was scheduled Sunday.

Marriages

Paula Beaudoin of Roxbury, Mass., now Mrs. Paula Doisneau, Needham Heights, Mass.
Mary C. Bernardi of Federal, Pa., to Joseph Thomas, San Antonio, Texas.
Marion Bonisteel, Buffalo, N.Y., now Mrs. Marion Prince, Kenmore, N.Y.
Rose Marie Castagna of Tombstone, Ariz., to James L. Kelly, Salt Lake City, Utah.
Hilda Holtebeck of Tulsa, Okla., now Mrs. B. B. Hays, Bismarck, N.D.
Lucy Hopkins of Orleans, Mass., to Joseph P. Buckley, Jr., New Haven, Conn.
Norma Hopson of Buffalo, N.Y., now Mrs. Norma H. Sirotiak, Des Moines, Iowa.
Nelle Humphreys, Ft. Belvoir, Va., now Mrs. Nelle H. Malmberg, Ft. Belvoir.
Helen Laue of Milwaukee, Wisc., now Mrs. Helen L. Loewi, Milwaukee.
Mary Jane Morgan of Youngstown, Ohio, to Albert E. Lasher, Youngstown.
Else Poulsson of Palo Alto, Calif., now Mrs. Else P. Todsen, Palo Alto.
Louis Pozarny of Buffalo, N.Y., to Rolene Fogan, Buffalo.
E. Fair Stucky of La Junta, Colo., to Don Snapp, La Junta.

New Student Members

Baylor University
Patricia Keahey

Columbia University
Maurice Briefer

New York University
Jack M. Gootzeit

Stanford University
Robert Couture

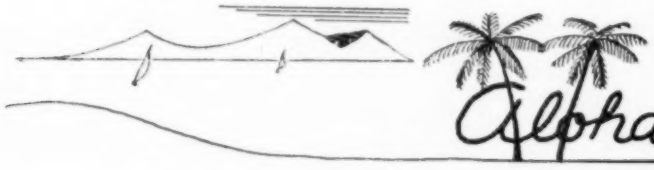
Mary E. Bennett on Teaching Staff

The University of Southern California announces the appointment of Mary E. Bennett to the teaching staff of the Department of Physical Therapy. Since last fall, Miss Bennett has been treating patients and supervising students in the Physical Therapy Department of the Student Health Service, teaching hydrotherapy, and assisting in anatomy dissection.

Miss Bennett holds a B.A. degree from Willamette University and received her physical therapy certificate from the University of California. She has taught physical education in La Grande Public Schools and was Director of the City Playground at LaGrande, Oregon. Prior to coming to the University, Miss Bennett was physical therapist at the Los Angeles County General Hospital.

SEE YOU ON THE

BLUE PACIFIC SHORE IN '54



Aloha nui oe!

Los Angeles, California, June 27 - July 3, 1954

Hotel Statler

Business Meetings and Program Schedule

June 25th and 26th	Executive Committee Meetings
June 27th	
10:00 a.m. to 5:30 p.m.	**School Section**
5:00 p.m. to 8:00 p.m.	Hoolaulea (Make Merry) — Southern California Chapter, Host
June 28th	
9:00 a.m. to 12:00 noon	Registration — Clinic Visits
10:00 a.m. to 12:00 noon	Group Meetings
2:00 p.m. to 5:00 p.m.	Opening Session — President's address — Lt. Col. Harriet S. Lee. Address by Aura E. Severinghaus, Associate Dean, Columbia University, College of Physicians and Surgeons.
7:00 p.m. to 10:00 p.m.	Discussion of Bylaw Amendments
June 29th	
9:00 a.m. to 12:00 noon	House of Delegates
2:00 p.m. to 5:00 p.m.	**Neurophysiology of the Peripheral and Central Nervous Systems**
	Peripheral Motor Mechanisms — Anthonie van Harreveld, Professor of Physiology, California Institute of Technology
	Cerebral Association Mechanisms—Johannes M. Nielsen, M.D., Consultant for Aphasia in the Veterans Administration
	Central Motor Mechanism — Jann Brown, M.D., Assistant Professor of Pathology, School of Medicine, University of California at Los Angeles
5:00 p.m. to 8:00 p.m.	Election of Officers
June 30th	
9:00 a.m. to 12:00 noon	**Rehabilitation of the Brain Injured** — Staff of the Physical Medicine Service, Letterman Army Hospital, San Francisco
9:00 a.m. to 12:00 noon	**Sequelae of Cord Injuries** — Ernest Bors, M.D., Chief, Paraplegia Service, Veterans Administration Hospital, Long Beach, California and Staff Physical Therapists.
2:00 p.m. to 5:00 p.m.	House of Delegates
6:00 p.m. to 7:30 p.m.	Reception of National Officers
7:30 p.m.	Annual Banquet
July 1st	
9:00 a.m. to 12:00 noon	**Respiratory Problems** — Medical and Physical Therapy Staff, Respiratory Center, Rancho Los Amigos
9:00 a.m. to 12:00 noon	**Management of the Cerebral Palsied** — Maxwell M. Andler, M.D., Medical Director, Physically Handicapped Children's Program, County of Los Angeles; Margaret Rood, Elk's Foundation, Mobile Unit, Indio, California; Marcia Hays, M.D., Chief, Bureau of Crippled Children's Service, California.

2:00 p.m. to 5:00 p.m.	**Research and Clinical Studies Reports**
7:00 p.m. to 10:00 p.m.	Scientific Movies

July 2nd

9:00 a.m. to 10:30 a.m.	**Demonstration of a Case Conference** — Staff, Los Angeles Orthopedic Hospital
11:00 a.m. to 12:00 noon	**Demonstration of Home Instruction** — Lois Olmsted, Health Department, County of Orange, California
2:00 p.m. to 5:00 p.m.	House of Delegates — Clinic Visits

July 3rd

9:00 a.m. to 12:00 noon	Workshop on Chapter Organization

A recess will be scheduled each Morning and Afternoon to visit exhibits.

Facts About the Conference

Hotel

The Statler Hotel is air conditioned and is one of the newest and most modern hotels in the country.

Rates

Are from $6.50 for a room and bath for one. Double bedded rooms with bath for two start at $11.50. Living room, bedroom and bath for two start at $22.00. For each additional person in double or twin-bed room the extra charge is $2.50 per day.

Reservations

Reservation cards will be sent out with the dues notices. Those who wish to room together should send in only one reservation including names of all roommates. The number of minimum priced rooms is limited and the hotel will acknowledge reservations within a range dependent upon availability at the time of arrival. When single rooms are filled the hotel will assign roommates.

Registrations

Active and Inactive Members	$5.00
Student Members	1.00
Other Physical Therapy Students	2.00

Advance registration cards will be sent to members with the dues notices. If you do not register in advance you *must* present your membership card when you register.

Physical therapists who are graduates of approved schools but not members of the Association may attend the general sessions on introduction by a member and paying a registration fee of $15.00.

Exhibits

Technical, scientific and chapter exhibits will be a part of the Conference. Technical exhibitors should contact Gordon M. Marshall, 30 West Washington St., Chicago 2, who is Exhibit Manager.

Travel Tips

All transcontinental air and bus lines have excellent service to Los Angeles. Round-trip reserved coach by rail from New York is as low as $165.00 including tax, and round-trip air coach, $226.00. The average travel time from New York by air is 12 hours and by train 55 to 60 hours.

Motion Pictures

Time has been set aside for showing motion pictures and slides which would be of interest to physical therapists. Any members or organizations who have movies, slides, or film strips to show at the Annual Conference may apply for inclusion in the program to the American Physical Therapy Association, 1790 Broadway, New York 19, New York.

All applications should contain the following information:

1. Title and brief description of the subject matter covered
2. Length of film and time needed to show it
3. Size of film — 8, 16, or 32 mm; silent or sound; black and white or colored
4. Number of slides and time needed to show them
5. Size of slides — 2 x 2, or 3 x 4; kodachrome or black and white
6. Name of organization and individual responsible for material

The Program Committee will select those films and slides which in their judgment will be of greatest interest to the audience and which will fit into the time allotted. Only films and slides thus selected will be shown.

Big Pines Park with Jackson Lake set in its rugged terrain.

Courtesy of the Los Angeles Chamber of Commerce

Hoolohe!

Ke Ia Manawa

For the past six months we have been thinking, talking and reading about getting to the Blue Pacific Shore in June of '54. Ke Ia Manawa — the time has come!

Are you ready to start?

Will you be there in time for the Hoolaulea on Sunday evening? Remember, Hoolaulea means "make merry." Don't miss the fun of this first social get-together of the 1954 Conference.

The entertainment committee is keeping details of both the Hoolaulea and the Banquet very hush-hush. At this writing even your reporter can only guess at the many surprises in store for us. We might state however that Dame Rumor and the good old grapevine whisper of tropical blossoms, exotic food, and entertainment that will cast a magic spell.

On Your Own

Monday morning and Friday afternoon have been designated as open-house days at the hospitals where many fine physical therapy departments may be visited. Among them are:

CHILDREN'S HOSPITAL OF LOS ANGELES—This hospital of 226 beds is the only general medical and surgical hospital for infants and children in Southern California. It is also the location of one of our physical therapy schools.

LOS ANGELES COUNTY HOSPITAL—the largest in the world.

RANCHO LOS AMIGOS—center for respiratory polio.

ORTHOPEDIC HOSPITAL—for many years a leader in the field of orthopedics under the guidance of beloved Dr. Charles LeRoy Lowman. Noted for its far reaching clinics and activity clubs for its patients and alumni.

ADELAIDE TICHENOR CLINIC—in Long Beach, a model orthopedic center providing physical therapy for children and teen-agers as well as complete orthopedic and pediatric care.

The Conference Information Booth will provide lists of all hospitals and P.T. Centers with the necessary directions and information.

Want to Do The Town?

Tuesday evening also has been left at your disposal. You may wish to sight-see, attend a theater or frolic at a night club.

The city of Los Angeles covers 453.49 square miles, almost half the size of Rhode Island, and the metropolitan area, which includes almost all of Los Angeles County, is about half the size of Vermont.

It becomes obvious that sight-seeing on a limited time budget might prove fairly difficult unless one knows the town well. The Conference Information Booth will supply you with maps, trip folders and assist you in making the most of your limited time.

As a rule one can cover more territory in less time by taking some of the conducted tours about the city such as those offered by the Tanner Gray Line Service. We mention but a few of the many available.

PASADENA and HUNTINGTON LIBRARY—includes the Los Angeles Civic Center; Rose Bowl; California Tech, noted scientific center; Huntington Library, housing world renowned paintings, sculpture, books; San Gabriel Mission.

HOLLYWOOD and MOVIE STUDIOS—

FOREST LAWN—world's most beautiful Memorial Park where one may see the largest religious painting in America, John Styka's "The Crucifixion", 45 feet high and 195 feet long. Also to be seen is the Last Supper Window, a reproduction in stained glass of DaVinci's famous fresco.

At Forest Lawn you may visit the Little Church of the Flowers, the Wee Kirk of the Heather, a replica of the church where Annie Laurie worshipped in Glaincairn, Scotland; the Church of the Recessional; and the copy of Michelangelo's "David" standing high on a hill overlooking the valley.

KNOTT'S BERRY FARM—with Gold Rush Village, Ghost Town, authentic gold mine, Calico Railroad, stagecoaches, country stores and excellent food.

RADIO, TV CENTERS and FARMER'S MARKET—acres of produce and quaint shops and choice of food representing fifteen different countries.

NITE TOUR OF LOS ANGELES—includes Olvera Street and Mexican Shops, China Town, Griffith Observatory, Hollywood and Wilshire Blvds.

CATALINA ISLAND—22 miles across the channel may be reached by ship, water-taxi or plane. Here one may swim in ocean water smooth as any lake, peer at undersea life through glass bottom boats, watch seal herds sun themselves on nearby rocks or gasp as whole schools of flying fish hurtle through the night air into the beam of giant searchlights.

THE BEACH TOWNS—stretching southward along the coast include Malibu, Santa Monica, Ocean Park, Venice, PlayaDel Rey, Manhattan, Hermosa and Redondo.

Most of the conducted tours in and about the city take about three hours and cost from $2.50 to $5.00.

How Far to Los Angeles?

From New York— 3,286 miles
From Washington— 2,140 miles
From Atlanta— 2,240 miles
From Chicago— 2,122 miles
From Dallas— 1,436 miles
From Minneapolis— 1,504 miles
From Kansas City— 1,617 miles
From Seattle— 1,179 miles

Where ever you are we hope you are now about to pack your bag and head for the Blue Pacific Shore humming that grand old tune, "California, Here I Come."

Post Conference Mexican Tour

A personally conducted two-weeks' air and motor tour through Mexico will be arranged if as many as fifteen physical therapists sign up. This will include a tour of the physical therapy departments at the Hospital Anglo-Americano and Clinica Primavera in Mexico City where children polio patients are treated.

For detailed information write to John Hilton, Twenty-nine Palms, California.

Group Meetings Scheduled for Conference

Monday morning, June 28, has been set aside for registration and special group meetings from 10 a.m. to 12 noon as follows:

Official Crippled Children's Program

Descriptions of physical therapy service rendered in Utah and Oregon will be given and followed by question and answer periods. Time will be allowed for presentation of problems of interest to individual states. The meeting will be held in the Cleveland Room.

Physical Therapists from Societies for Crippled Children

Physical therapists from Societies for Crippled Children are invited to meet with Louise Bailey, Physical Therapy Consultant, National Society for Crippled Children and Adults, Monday, June 28 in the Boston Room. Please indicate your interest in attending and suggest any special points which you would like to discuss with other physical therapists in Societies for Crippled Children by writing to Miss Bailey, National Society for Crippled Children, 11 South La Salle Street, Chicago 3, Illinois.

Physical Therapists in the Veterans Administration

Members of the Association who are employed by the Veterans Administration will meet with Mrs. Florence Linduff in the Washington Room.

Physical Therapists — Self Employed

In response to several requests this group is called to meet for the first time to discuss mutual problems and their relation to the functions of the Association. The meeting will be held in the Mission Room.

Advisor to Address Conference

Aura T. Severinghaus, Ph.D., a member of the Advisory Council of the Association, will give the opening address at conference on Monday afternoon June 28. Dr. Severinghaus is co-author with Harry Carman, Ph.D., and William Cadbury, Jr., Ph.D., of the recently published book "Preparation for Medical Education in the Liberal Arts College." The book represents more than two years of extensive research and stresses the importance of a broad cultural background for medicine or any other profession. Dr. Severinghaus will relate his study to Physical Therapy Education.

Conference Speakers on Management of the Cerebral Palsied

Maxwell M. Andler, Jr., M.D., will be the opening speaker for this section of the program. Dr. Andler is Medical Director of the Physically Handicapped Children's Program for the County of Los Angeles and is a neurosurgeon.

The state of California has been a leader in planning and providing services for the cerebral palsy child. **Marcia Hays, M.D.** will describe this program to members attending the 1954 conference on the morning of July 1.

Dr. Hays is Chief, Bureau of Crippled Children's Services, State Department of Public Health, California. She received her M.D. from the Stanford School of Medicine and her Dr.P.H. was awarded by the Yale School of Public Health. Her field of specialization is public health and prior to accepting her present position she served as: Chief, Maternal and Child Health and Crippled Children's Services; Territorial Department of Health, Alaska; Chief, Crippled Children's Services, Insular Department of Health, Puerto Rico; and Regional Medical Director, United States Children's Bureau.

Margaret Rood, who is qualified as both an occupational therapist and physical therapist, is presently in charge of the California Elks Association Mobile Unit for Riverside County. Miss Rood will discuss the "Use of Neurophysiological Reactions as a Basis for Physical Therapy." Before accepting her present position she was Chairman of the Occupational Therapy Department, University of Southern California.

Miss Rood received her A.B. degree and occupational therapy diploma from Milwaukee Downer College and later earned her M.A. degree and physical therapy certificate at Stanford University. Readers of the *Physical Therapy Review* will recall her paper on "Occupational Therapy in the Treatment of the Cerebral Palsied" published in the February 1952 issue.

Conference Demonstration

The conference demonstration on Home Care Instruction on Friday morning will be led by **Lois Olmsted,** Supervisor of Physical Therapy with the Orange County, California, Health Department.

Miss Olmsted, who is a member of the Association, has had wide experience both as a nurse and physical therapist in the field of public health. She was a physical therapist with the Visiting Nurse Association in Chicago and later nursing supervisor on orthopedics at the Good Samaritan Hospital in Portland, Oregon. From 1944 to 1950 she was on the staff of the Joint Orthopedic Nursing Advisory Service.

Conference Demonstration of a Case Conference

On Friday morning members of the staff at the Orthopedic Hospital will participate in a demonstration of a Case Conference led by **Charles LeRoy Lowman, M.D.** Dr. Lowman, who is an honarary member of the American Physical Therapy Association, is Director of Education and Rehabilitation at the Orthopedic Hospital, and Medical Director of the School of Physical Therapy at the University of Southern California. He is a member of the American Orthopedic Association and American Academy of Orthopedic Surgeons and has long been recognized as one of the outstanding orthopedic surgeons in this country. Associates who will take part in the conference include a physical therapist, occupational therapist, nurse, resident physician, psychologist, social service worker and teacher.

Conference Program on Rehabilitation of the Brain-Injured

This program will be presented on Wednesday morning, June 30, by members of the staff of the Physical Medicine Service of Letterman Army Hospital.

Lt. Col. Raoul C. Psaki who is Chief of the Service is also Assistant Clinical Professor of Physical Therapy at Stanford University. He is diplomate of the American Board of Physical Medicine and Rehabilitation and received his M.D. from Georgetown Medical School. He is the co-author of numerous articles which have appeared in medical journals and the *Physical Therapy Review*.

Capt. Warren J. Treanor, Assistant Chief of the Physical Medicine Service has been a fellow of the Medical Research Council of Ireland. He received his education at the National University of Ireland and the University of Minnesota.

Major Olena Cole and **1st Lt. Rosie Dabato** will represent the Physical Therapy Section in discussing Muscle Reeducation and Assistive Devices with Demonstrations of Technics.

Alpha Epsilon Delta Award

The first Distinguished Service Award of Alpha Epsilon Delta, the national premedical honor society, was presented to Dr. Aura E. Severinghaus, associate dean, faculty of medicine, Columbia University, for his outstanding contributions to premedical education. The award was presented on March 26, during the 10th national convention of the society, held at Indiana University.

Dr. Severinghaus has served on the Advisory Council of the American Physical Therapy Association for the past four years and will deliver the opening address at the 31st Annual Conference held in Los Angeles.

"You Can Get Well Faster"

This brochure prepared by Nila Kirkpatrick Covalt, M.D., is now available in quantity for distribution to patients from the National Office. There is no charge except a contribution to cover postage or express cost.

Dr. Covalt directed the pamphlet to the patient to help him "get well faster" through relaxation and bed exercise. Cartoon illustrations are effective in telling the story.

National Headquarters

Lucy Blair and **Ruth Whittemore** spent the week of March 29 in Detroit in discussions with the Polio Planning Committee of Wayne County.

Miss Blair attended and spoke at the annual meeting of the North Carolina Chapter, April 10.

The week of April 25 was spent in Pittsburgh participating in the week-long orientation session held at the D. T. Watson School of Physiatrics for physical therapists who will be participating in the vaccine evaluation program. Thirty-four physical therapists attended.

Mary Haskell was in the field from April 5 to 15; in St. Louis, for preliminary planning with the Chapter and the Hotel Jefferson for the 1956 Conference; in Ohio, visiting the Districts and Executive Committee of the Ohio Chapter. During her time in Ohio, Miss Haskell visited many clinical facilities.

Dorothy Hewitt, April 12 to 18, attended with Marjorie Hyer the annual meeting of the American Personnel and Guidance Association. The APTA had an exhibit which afforded an opportunity to discuss physical therapy as a career with vocational guidance counselors. April 26 to 27, Miss Hewitt visited the Department of Physical Therapy, Boston University, Sargent College of Physical Education.

Marjorie Hyer, March 26 to April 12, conducted a Workshop on Public Relations and made plans for publicity for the annual conference. On her return trip she stopped in Albuquerque, Tucson, Phoenix and Salt Lake City to meet with the chapters.

Mildred Elson, in Washingotn, April 26 to 28, attended a meeting of the Consultants on Physical Therapy in the Veterans Administration. Visits were made to the Federal Civil Service Commission, Office of Vocational Rehabilitation, and Bureau of Medicine and Surgery, U. S. Navy.

The Editorial Board of the *Review* met in the National Office, April 3rd.

Index to Current Literature

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A Counseling Program Is More Than the Counselor. Ruth V. Johnston, Am. J. Nursing, 54:173-174, February 1954.

Some Aspects of the Surgical Treatment of Open Hand Injuries. Stephen Barclay, Australian & New Zealand J. Surg., XXIII:131-138, November 1953.

Total Child Care in a Temporary Shelter. Dorothy C. Y. Yang and Lawrence B. Slobody, Arch. Pediat., 71:1-10, January 1954.

Metabolic and Electroencephalographic Changes in Idiopathic Epilepsy. C. Bruce Hatfield, D. R. Wilson, and Harold V. Rice, Arch. Neurol. & Psychiat., 208-216, February 1954.

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An Appraisal of Current Methods of Treating Cerebral Palsy. III. Treatment of Cerebral Palsy away from Medical Center. Everett M. George, Am. Pract. 5:123-125, February 1954.

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The Physiology of Motivation. Eliot Stellar, Psychol. Rev., 61:5-22, January 1954.

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Hearing and Language Evaluation with Hard of Hearing Children. John A. Irwin and Anne R. Shreve, Arch. Otolaryng., 59:186-191, February 1954.

Physical Therapy Programs—1954

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

DEGREE and CERTIFICATE PROGRAMS—Information on specific entrance requirements should be obtained from the schools listed below. Schools offering a degree will accept high school graduates for the four year program leading to a baccalaureate degree, *as well as transfer students.* A certificate program is a concentrated course of study offered to those who have completed all or most of their undergraduate work before declaring a major in physical therapy. Graduates of either the degree or certificate programs are equally qualified.

	Degree Program	*Certificate Program*
California		
School of Physical Therapy Childrens Hospital Society (Univ. of California at Los Angeles) 4614 Sunset Boulevard Los Angeles 27	†	†
School of Physical Therapy College of Medical Evangelists White Memorial Hospital Boyle and Michigan Avenues Los Angeles 33	†	*
Department of Physical Therapy University of Southern California University Park Los Angeles 7	†	†
Curriculum in Physical Therapy School of Medicine University of California 3rd and Parnassus San Francisco 22	†	†
Division of Physical Therapy Stanford University Stanford	†	†
Colorado		
School of Physical Therapy School of Medicine University of Colorado 4200 East 9th Avenue Denver 7	†	†
Connecticut		
School of Physical Therapy University of Connecticut Box U 101 Storrs	†	
Illinois		
Course in Physical Therapy Northwestern University Medical School 303 East Chicago Avenue Chicago 11	†	†
Iowa		
Department of Physical Therapy State University of Iowa University Hospitals Iowa City		†
Kansas		
Section of Physical Therapy University of Kansas Medical Center 39th and Rainbow Boulevard Kansas City 3	†	†
Louisiana		
School of Physical Therapy Charity Hospital of Louisiana 1532 Tulane Avenue New Orleans 12		†
Massachusetts		
Department of Physical Therapy Boston University Sargent College of Physical Education 6 Everett Street Cambridge 38	†	†
*Course in Physical Therapy Bouve-Boston School Tufts College Medford 55	†	
*Program in Physical Therapy Simmons College The Fenway Boston	†	†
Michigan		
Curriculum in Physical Therapy University of Michigan 1313 East Ann Street Ann Arbor	†	†

*Accepts women students only.

	Degree Program	*Certificate Program*
Minnesota		
School of Physical Therapy Mayo Clinic 102-110 Second Avenue, S.W. Rochester		†
Course in Physical Therapy University Hospital, 204-TWH University of Minnesota Minneapolis 14	†	
Missouri		
Division of Health and Hospital Services St. Louis University 1325 South Grand Boulevard St. Louis 4	†	
Department of Physical Therapy School of Medicine Washington University 660 South Kingshighway St. Louis 10	†	
New York		
*School of Physical Therapy Albany Hospital (Russell Sage College) New Scotland Avenue Albany 8	†	†
Courses for Physical Therapists Columbia University College of Physicians and Surgeons 630 West 168th Street New York 32	†	†
Physical Therapy Division School of Education, New York University Washington Square East New York 3	†	†
Program in Physical Therapy University of Buffalo 2183 Main Street Buffalo 14	†	†
North Carolina		
Physical Therapy Course School of Medicine Duke University Durham		†
Ohio		
Course in Physical Therapy Frank E. Bunts Ed. Inst. Cleveland Clinic Hospital 2020 East 93rd Street Cleveland 6		†
Pennsylvania		
Division of Physical Therapy School of Auxiliary Medical Services University of Pennsylvania 1818 Lombard Street Philadelphia 46	†	†
Division of Physical Therapy The D. T. Watson School of Physiatrics (In affiliation with the University of Pittsburgh) Sunny Hill Leetsdale	†	†
Texas		
Grady Vaughn School of Physical Therapy Baylor University University Hospital Dallas	†	†
Hermann School of Physical Therapy Hermann Hospital 1203 Ross Sterling Avenue Houston 5		†
Division of Physical Therapy University of Texas School of Medicine Galveston	†	†
Virginia		
School of Physical Therapy Baruch Center of Physical Medicine and Rehabilitation Medical College of Virginia 1203 East Broad Street Richmond 19	†	†
Wisconsin		
Course in Physical Therapy Medical School, University of Wisconsin Madison 6	†	†
U. S. Army Medical Service		
*Physical Therapy Course Medical Field Service School Brooke Army Medical Center, Fort Sam Houston, Texas and Brooke, Letterman and Walter Reed Army Hospitals Write to: The Surgeon General Department of the Army Washington 25, D. C. Att: Personnel Division		†

*Accepts women students only.

Please direct all inquiries regarding tuition, entrance requirements and other specific information to the school and *not* to the American Physical Therapy Association.

Abstracts

Studies on the Effect of Exercise on Cardiovascular Function.

Robert S. Fraser and Carleton B. Chapman, CIRCULATION, IX:193-198, February, 1954.

During exercise in normal subjects the systolic pressure rises, the diastolic pressure falls, and the mean pressure does not change significantly when measured by a direct intra-arterial method.

In men, during the first few seconds after cessation of exercise, the systolic pressure falls precipitously, the diastolic pressure changes little, and the mean tends to fall. In women, the systolic pressure falls more gradually than in the men, but the validity and the significance of this sex difference are uncertain.

Between 10 and 30 seconds after cessation of exercise, the older men show a significant secondary rise in all three pressure items. Younger men and women fail to show a secondary rise in systolic pressure but demonstrate a gradual increase in both diastolic and mean pressures.

By the beginning of the sixth minute of recovery from exercise, the mean pressure returns to, or nearly to, the resting level in all three groups of subjects. Systolic pressure is close to, or slightly less than, the resting value, and the diastolic pressure in each group remains somewhat above the resting level.

Changes in pulse rate during and after exercise are similar in all three groups. By the sixth minute after exercise pulse rates in each group still exceed the respective resting values by about 15 per cent.

Principles and Policies of Personnel Management.

Malcolm Macurda, J. AM. DIETET. A., 30:128-132, February 1954.

There are two general areas that require attention. First, the total management climate must provide a well defined, humanitarian and personnel policy under which the lower levels of supervision can work in a compatible, understanding manner. The second general area concerns the actual carrying out or execution of these philosophies by the management person directly responsible for the guidance and direction of the employees doing the job.

The general top management area of authority plans the over-all policies of the company. We, as supervisors closer to the work operations, want to form and discharge our own leadership technics and skills in such a way as to gain the utmost cooperation within our work group. As Dr. Gardner so aptly phrases it, "a prescription for more effective foremen comprises techniques for 'giving' to his work group enough satisfaction and security, both individually and as a group, that cooperation will follow spontaneously and inevitably." This means giving the group some voice in planning their work, hearing their suggestions, being proud of "the gang" and praising them, and saying "we" instead of "I."

The person who has to do all these things is *you*. No one else can do them. You *are* the company to your people and you represent them to the company. When you carry out these obligations day by day, you can make one simple test of their effectiveness by asking yourself one simple question, "Are my people *lucky* to have me as their supervisor?"

A Clinical Estimation of the Blood Pressure in the Minute Vessels of the Human Skin by the Method of Elevation and Reactive Hyperemia.

Rutherford S. Gilfillan, Norman E. Freeman, and Frank H. Leeds, CIRCULATION, IX:180-192, February 1954.

A simple elevation reactive hyperemia test which is useful in estimating the development of collateral circulation in obstructive peripheral vascular diseases and in separating these from vasospastic conditions has been described. The filling of the capillaries of the skin has been observed to correspond to the spread of the hyperemic flare of pink flush. The filling pressure of the minute vessels as measured by elevation and reactive hyperemia seems to vary between wide limits. The lower limit of pressures necessary to allow spontaneous healing of necrotic lesions under the conditions described seems to be in the magnitude of 35 cm. above the phlebostatic "axis." A similar limit for the successful performance of amputation at the level of the forefoot or toes seems to exist at about 45 cm. above the phlebostatic "axis."

Low Back Pain and Sciatica.

Louis T. Palumbo, AM. PRACT., 5: (Feature Article) 1-31, February 1954.

Low backache with or without sciatica is one of the commonest afflictions of mankind. The causes are legion. The commonest, however, are a result of poor posture, acute or chronic injuries, protruded or degenerative intervertebral disc, congenital anomalies of the spine, and instability of the lumbosacral spine.

A thorough history and physical examination, with particular reference to the back; a neurological examination; special laboratory tests; roentgenograms of the spine, and in some patients, myelographic studies, will in most cases establish an accurate and correct diagnosis.

Therapy in about 90 per cent of the cases is limited entirely to nonoperative conservative measures. Surgical treatment is indicated for those patients (about 10 to 15 per cent) who failed to respond to a positive program of conservative treatment; for those individuals who present evidence of an intra- or extraspinal lesion or compression of a nerve root with sensory and motor changes; for those who are chronically disabled from recurrent attacks of low back pain; and for those who have congenital bony abnormalities of the lumbosacral spine which have, likewise, not responded to conservative measures.

The author presents an extensive bibliography.

A Survey of the Rh Problem in Toronto, 1947-1952.

W. L. Donohue, Margaret A. Mullinger, E. G. Cook, and C. E. Snelling, AM. J. OBST. & GYNEC., 67:233-247, February 1954.

In pregnancy, the major clinically significant isoimmunization is in the Rh (D) negative mother and the important sensitized factor is D.

A particularly severe type of isoimmunization is induced by transfusion, especially if the transfusion occurs after puberty. If an Rh (D) negative female infant or child received Rh-positive blood, the results may not be so serious as hitherto suspected.

A mother may have a surviving normal erythroblastotic infant subsequent to one that died.

ABO incompatibility of a mother with her infant protects against Rh

isoimmunization and if sensitization does occur the disease of the infant is relatively mild.

Clinical erythroblastosis appears most frequently and in its most benign form in the second pregnancy.

Erythroblastosis is slightly more common in male than in female infants.

The severity of the disease in infants is affected by many factors: (a) the sequence of pregnancy; (b) ABO incompatibility between mother and infant; (c) prematurity; (d) whether isoimmunization was induced by pregnancy or transfusion.

All of these should be taken into account if possible, in the assessment of any form of treatment.

Exchange transfusion appears to be the treatment of choice except possibly in mild cases.

Kernicterus is the one severe sequel to erythroblastosis. According to the authors' figures, there is a significant decrease in the incidence with replacement transfusions. As kernicterus rarely manifests itself before 36 hours of age, the answer to the problem is early treatment and possibly repeated replacement if jaundice appears to be impending.

ABO incompatibility is a mixed blessing. It rarely causes disease by itself, but it also protects against Rh isoimmunization.

Planning Easier Work.

John G. Carlson, J. AM. DIETET. A., 30:133-137, February 1954.

Each business or organization has only a limited energy budget in the form of manpower, materials, and equipment to furnish products or services. An *efficient* business demands that more products or services be obtained with the same energy budget and often at a lower cost in money and fatigue.

The author presents such procedures as; the scientific approach, distribution of work loads, process analysis, man-machine relationship, operation chart, design of work place and selling an idea.

The dietitian can have other technics available to help make work easier. Recent developments in the statistical sampling approach have been effective in obtaining more information on a working environment in less time and at reduced costs than previously possible. Predetermined times for fundamental work activities make it possible to be more objective in recognizing areas needing improvement and evaluating alternatives. Research in the physiologic cost of work also yields more objective criteria for methods study.

At the same time, management and the engineer can expect more valuable help from the dietitian and the food service employees who are familiar with easier work technics. With such advice, recommendations for labor-saving equipment and facilities will be more factual and complete, and work will be performed more efficiently. We all can plan on having our work made easier by adopting the philosophy of "there must be a better way" and utilizing the technics which have been developed to help find that better way.

Congenital Deformities of the Foot in Childhood.

C. F. Ferciot, NORTHWEST MED., 53: 34-36, January 1954.

Correction of deformities of the foot should be started as soon as possible in order that future growth may be directed into normal channels.

Bony and ligamentous deformities are, in general, reflections of primary muscle defect and normal growth cannot be expected without restoration of muscle balance.

Early recognition and correction of dorsiflexion deformity of the foot can be expected to lower the incidence of developmental flatfoot.

There is a need for further investigation and understanding of etiologic factors in congenital deformities.

Cerebral Palsy Research and the Preschool Years.

Arnold Gesell, POSTGRAD. MED., 15: 104-108, February 1954.

Development is a key concept. It leads to the coordination of data from a wide diversity of investigations.

A science of normal child development is basic to an understanding of the handicaps produced by cerebral injury whether mild, severe or selective.

Pediatrician, child neurologist and clinical psychologist are obliged to appraise the patterns and potentials of growth, particularly the growth of mind and personality.

The concept of development also has constructive, orientational values for therapist, teacher, social worker and the family. It helps all concerned to see and envisage the problems of care and education in truer perspective.

This makes the preschool years, including infancy, of critical importance in policies of research and of treatment programs.

The public has a new stake and a new interest in research. It senses the possibility that much more can be done in behalf of disabled children. The normal aspects of cerebral palsy, however, are sometimes overemphasized in a manner which obscures the underlying developmental factors. From the standpoint of public relations it would seem wise to encourage a realistic recognition of these factors. The attitudes and insight of the public will inevitably influence the directions of continuing research.

A developmental approach, therefore, has social as well as clinical implications. It favors gradual and progressive procedures in diagnosis, supervision, therapy and education. It promotes mutual understanding between the professions and the family. A developmental philosophy, moreover, protects mental health and spiritual values, for it adheres to the ideal that, in a democracy, every child, normal or handicapped, is entitled to an ample realization of his growth potentials.

Triceps Surae Syndrome in Cerebral Palsy.

Lenox D. Baker, ARCH. SURG., 68: 216-221, February 1954.

During the past decade or more, overemphasis on so-called conservative therapy for the cerebral palsy patient has overshadowed the benefits derived from numerous surgical procedures. A reevaluation of the overall therapy and a reawakening to the benefits to be derived from surgery are needed. When indicated in the properly selected patient, recession of the heads of the gastrocnemius portion of the triceps surae muscle will allow dorsiflexion of the ankle, will cut down on clonus, and will allow extension of the knee with the ankle dorsiflexed. The procedure should be given due consideration before one attempts an achilles' lengthening or neurectomy to one of the components of the triceps surae muscle.

The Trained Obstetrical Patient.

J. C. Portnuff, AM. J. OBST. & GYNEC., 67:268-272, February 1954.

While the figures presented do not make an incontestable case for a program of training in preparation for childbearing, they do suggest that labor may be shorter and less painful, since fewer analgesics and sedatives were needed without increasing patient discomfort. Pudendal block is undoubtedly a safe anesthetic. It permits the patient to be fully conscious at delivery if she so desires. We believe that active participation in the birth of her child has a beneficial emotional impact on the mother, and most patients have expressed amazement and delight at their participation in the exciting phenomenon of childbirth. Nurses are impressed with their behavior. They assert that it is easy to pick out the trained patient from her deportment during labor and delivery. As was stated earlier, the sense of well-being and the cooperation of these patients cannot be reduced to figures.

The author doubts that what has been presented can be termed natural childbirth. During the prenatal training program no emphasis is placed on spontaneous delivery or delivery without anesthesia or analgesia. There is no question raised of success or failure. If patients succeed only in imperfect relaxation and prefer to be unconscious for their deliveries, we do not consider them to have failed. All that is promised is that benefit will accrue from the training. If they have succeeded in having easier, happier labors, with less anxiety and apprehension, then the extra time spent with these patients has been amply repaid.

An Analysis of Orthopedic Causes of Low Back and Sciatic Pain.

Col. Ernest A. Brav, AM. J. SURG., 87:235-240, February 1954.

Evaluation has been made of etiologic factors in a group of 200 patients presenting low back and sciatic pain of orthopedic origin.

The probable incidence of lumbar disc herniation as the principal cause of complaints was determined to be 36.5 per cent. The positive incidence as determined by operative exploration was 10.5 per cent.

Of the patients with clinical diagnoses of disc herniation 28.7 per cent came to operative intervention. Of this group the observations at operation revealed no evidence of disc herniation in 27.6 per cent.

Interpretation of the electromyogram in the diagnosis of lumbar disc herniation proved to be correct in 50.0 per cent of cases. The findings of the contrast myelogram were borne out at operation in 70.4 per cent.

A return to some form of military service was possible in 80.0 per cent of the patients who had surgical intervention with removal of herniated discs and in 62.5 per cent of those with negative operative explorations. In the entire group with the diagnosis of disc herniation the return to duty was 60.8 per cent.

A conservative approach is recommended in the treatment of low back and sciatic pain which is thought to be due to herniated lumbar intervertebral disc, but in patients in whom the complaints are of borderline severity, operative exploration seems entirely justified if there is no relief following adequate conservative management.

A Comparison of Generalized Reflex Myoclonic Reactions Elicitable in Cats Under Chloralose Anesthesia and Under Strychnine.

E. C. Alvord, Jr. and M. G. F. Fuortes, AM. J. PHYSIOL., 176:253-261, February 1954.

Some of the neurophysiological correlates of the generalized motor reactions (reflex myoclonus) which can be evoked in cats under chloralose anesthesia have been determined. The stimulus (light, sound, touch, etc.) must be suddenly applied; single electrical shocks to peripheral nerves must excite Lloyd's group II fibers to be effective; group III fibers may also be effective. In noncurarized animals the reaction occurs almost simultaneously in widely separated muscles after a relatively long latency. Although the movement is characteristically one of flexion, both flexors and extensors contract together. The late generalized reaction occurs independently of early segmental reflexes. In curarized preparations nerve excitation arises in the forelegs before the hindlegs. In general, the latency is longer for more caudally applied stimuli; if two stimuli are presented through the same neural segments, maximal facilitation occurs at simultaneity, but if they enter the C.N.S. through widely separated segments, the caudal one must precede the rostral one. The reaction is enhanced by parenterally administered strychnine and is abolished caudal to an acute transection of the spinal cord.

In contrast, during the generalized convulsive reactions which can be evoked in spinal strychninized cats, the stimulated segments respond first, and the spread to distant segments occurs only thereafter. Excitation of group II peripheral nerve fibers is necessary for these effects.

The results are interpreted to indicate that, whereas strychnine enhances rostral and caudal spread of intersegmental reflexes throughout the spinal cord, the reflex myoclonic reaction evoked under chloralose is due to a long reflex circuit involving supraspinal structures.

Lower Limb Reflexes of a "Chronic Spinal" Man in Cycles of Morphine and Methadone Addiction.

A. Wikler and M. Rayport, ARCH. NEUROL. & PSYCHIAT., 71:160-176, February 1954.

An opportunity presented itself to study the genesis of opiate abstinence syndrome in a patient with almost complete physiological 'transection' of the spinal cord. The patient had been previously addicted to opiates and volunteered for the experiments.

A control period preceded the addiction studies and control records were also kept during the 'recovery' periods for the entire seven months of the study.

It was found that single doses of morphine sulfate depressed the nociceptive flexor reflexes but had no effect on the stretch reflexes. During periods of active addiction to morphine the stretch reflexes became hyperactive. The nociceptive flexor responses during addiction continued to be depressed but not as greatly as from the single doses of morphine. When the morphine was withheld for 36 or 48 hours, the nociceptive flexor reflexes and spontaneous lower limb activity increased while the stretch reflexes were reduced. This abstinence syndrome was abolished when the administration of morphine was resumed.

Methadone, when administered in place of morphine in a ratio of 1 part methadone to 3 parts morphine, prevented the appearance of the abstinence syndrome. Removal of metha-

done resulted in a recurrence of the abstinence syndrome which continued with diminishing intensity for 90 days.

The lower limb abstinence syndrome which follows an abrupt withdrawal of morphine or methadone after a period of addiction is similar to that observed in chronic spinal dogs. It is inferred, therefore, that the genesis of the syndrome is related at least in part to certain physiological changes that occur over the entire neuraxis. These involve primarily internuncial neuron systems that undergo cyclic depression and excitation during opiate addiction. As addiction continues, the excitatory processes increase progressively and when opiates are withdrawn they become manifest.

Tourniquet Paralysis Syndrome.

Joseph Moldaver, ARCH. SURG., 68: 136-144, February 1954.

In a tourniquet paralysis there is a disturbance in the functions of the peripheral nerves which is apparently due to the mechanical pressure of the tourniquet on the nerve and is not the result of ischemia.

There is a constellation of symptoms that justify the term syndrome. The characteristics of this syndrome are as follows:

Motor function: There is paralysis with hypotonia or atonia, but no appreciable atrophy.

Sensory examination shows a dissociation of the sensations. The fibers subserving touch, pressure, vibration, and position sense are affected, and those sensations are usually absent. Pain sensation is never lost. In most of the cases there is actual hyperalgesia, that is, the pain is felt with a low threshold. In severe cases the first or fast pain can be affected. Heat and cold sensations are usually not affected or slightly disturbed.

There is no paresthesia or tinglings after release of the tourniquet, which is indicative of a block of the touch fibers, responsible for the tingling sensation. There is no Tinel's sign. There is no sign of neuroma at the site of the injury.

Sympathetic fibers are not affected. Pilomotor reflex is normal. Skin resistance is normal. Color of the limb is normal. Plethysmographic findings are normal. Temperature of the skin is normal.

Electrical studies show that there is a block of conduction characterized by lack of response to stimulation of the motor nerve above the injury, a good response below the injury. There is no tingling sensation to stimulation of the sensory fibers distal to the site of injury, but there is tingling sensation when the nerve is stimulated proximal to the lesion. The electrical stimulation can localize the level of the lesion.

Rostral Projection Pathway of the Vestibular System.

Walter A. Mickle and Harlow W. Ades, AM. J. PHYSIOL., 176:243-246, February 1954.

Electrical stimulation of the vestibular nerve has excited neural activity which may be tracked to the cerebral cortex in the cat. Recordings from the vestibular nuclei, the midbrain, thalamus and cortex have revealed that the cortical projection is achieved through second order neurons which decussate in the region of the trapezoid and take up a position between the lateral and medial lemnisci to end in the thalamus near the boundaries of the medial geniculate body and the posterolateral ventral nucleus. Third order neurons then project to the posterior bank of the anterior suprasylvian gyrus.

In general, the route of projection appears to consist of a group of fibers, which tends to be small and diffuse, and, therefore difficult to identify in degeneration experiments.

Small Vein and Artery Pressures in Normal and Edematous Extremities of Dogs Under Local and General Anesthesia.

F. J. Haddy, A. G. Richards, J. L. Alden, and M. V. Visscher, AM. J. PHYSIOL., 176:355-360, February 1954.

Methods are described in dogs for the measurement of pressures within small veins and arteries whose inside bore varied between 0.2 and 0.5 mm. The studies were carried out on these vessels under varying conditions and comparisons made against changes in larger veins and arteries in the same extremity.

In nembutal-anesthetized animals, the mean pressure in small veins did not vary significantly over long periods of time as compared with the same vessels in the normal awake animal. Large vein pressures average higher without a general anesthesia; therefore, under nembutal the pressure gradient from the small to large veins is positive. Under conditions of local anesthesia there were spontaneous fluctuations of small magnitude in the small vein pressures which could not be correlated with significant changes in pressure in the large veins. The occurrence of these spontaneous cyclic changes in small vein pressure without concomitant fluctuations in large vein pressure suggest that the small vein system may be subject to nervous or humoral control. Positive proof for this suggestion is lacking.

After exercise, pressures increased in both the small and large veins but to a greater extent in the small vessels.

In dogs in which edema had been induced by chronic arteriovenous anastomoses, studies of the small vein pressures confirm the dependence of edema of this type on hydrostatic factors. In animals with these A-V anastomoses the local small vein to large vein pressure gradient was elevated. Edema in such preparations was seen only in cases where small vein pressures approached the value of the plasma colloid osmotic pressure.

The Ligaments of the Sacro-Iliac Joint Examined with Particular Reference to their Function.

H. Weils, ACTA ANAT., XX:14-213 (no. 3), 1954.

The ligaments of the sacroiliac joint were dissected in 51 adults and 11 full-term foetal specimens, and a number of features not previously described were recorded. The elevations to which these ligaments are attached were examined in a number of dried, adult specimens (75 hip-bones and 64 sacra).

It was found that:

1. The sacrum and ilium are held in apposition by a capsular ligament and a number of accessory ligaments dorsal to it.

2. The striking feature of all the accessory ligaments in adults is that they are arranged in two distinct cranial and caudal groups of fasciculi, the former passing dorsally and laterally, and the latter cranially, from their sacral attachments; this disposition is not found in foetal specimens.

The significance of these arrangements is discussed and related to movements of the sacrum observed in the living.

Circulatory Responses to Intermittent Positive and Alternating Positive-Negative Pressure Respirators.

James V. Maloney, Jr., and Stanley W. Handford, J. APPLIED PHYSIOL., 6:453-459, February 1954.

The purpose of the present experiments was to evaluate in experimental animals the intermittent positive and the alternating positive-negative pressure respirators under the conditions in which they are most likely to be used; a combination of respiratory paralysis and circulatory inadequacy.

Experimental animals with competent circulatory and respiratory systems tolerate either the positive-negative or the intermittent positive type respirators without major alterations in blood pressure or cardiac output.

In the presence of respiratory failure and/or circulatory embarrassment, the intermittent positive type machines cause a depression in cardiac output and blood pressure which is sometimes fatal. The positive-negative type machines are distinctly superior in such circumstances, since they maintain adequate cardiac output and blood pressure. This latter type of respirator owes its desirability to a more favorable effect on venous return to the heart.

The objection that a negative pressure phase during expiration may produce pulmonary edema is not supported by experimental findings or theoretical considerations.

Effect of Reduced Tissue Pressure on Blood Flow of the Fingers: the Veni-Vasomotor Reflex.

Samuel Yamada and Alan C. Burton, J. APPLIED PHYSIOL., 6:501-505, February 1954.

The effect of reduced tissue pressures, up to —100 mm Hg on the blood flow of the finger was studied in five normal subjects, using the venous-occlusion plethysmograph under reduced plethysmographic pressure. Reduction of tissue pressure reduces the blood flow markedly. It is reduced to 50 per cent at —40 mm Hg and to 10 per cent at —100 mm Hg. This is interpreted as evidence, additional to that obtained by changes of level, that distension of the venous bed elicits a constriction of the local arterioles by a "veni-vasomotor reflex." On this interpretation, the receptors in the veins are shown to respond to stretch of the wall rather than to absolute pressure in the vessel. The cybernetic aspects of such a veni-vasomotor reflex are discussed.

Total Patellectomy.

W. Russell McAusland, AM. J. SURG., 87:221-226, February 1954.

The ensemble of results reported definitely establishes that total patellectomy has a place in the treatment of fractures. A simple intervention, it ensures rapid functional recuperation complete and definitive, in severely comminuted fractures and in long-standing unreduced, ununited or malunited fractures of either the transverse or comminuted type. The method has not been generally accepted as the routine treatment of fresh transverse fractures, and it is the writer's opinion that in the majority of transverse fractures good results are obtainable by operative reduction and screw fixatioa.

Total patellectomy is giving encouraging results in osteoarthritis of the knee joint, particularly when the process is confined to the patello-femoral segment. The method is also proving of value in the treatment of advanced chondromalacia and recurrent dislocation of the patella.

The writer's experience includes 28 cases of total patellectomy. Late observations were made in 21 of the cases, in 19, after a postoperative time lapse varying from five to fourteen years. Sixteen of the cases were fresh comminuted fractures, two were old fractures, one was an osteoarthritic process of the knee joint and two cases were recurrent dislocations.

Fifteen of the 21 patients obtained completely satisfactory results, the mobility and strength of the knee being normal. Two other patients mentioned having a sensation of insecurity at times. One patient complained of buckling of the joint and three patients had limited motion, but in none of these four cases could the result be charged directly to the operation. In the case of buckling there was evidence of a cartilage derangement, in two cases there were arthritic complications which had been present prior of the operation, and in the fourth case the patient had fallen and torn the new attachment of the patellar and quadriceps tendons. With the exception of two cases in which arthritic changes were already present in the knee joint at the time of the operation, no evidence of erosion was observed on the condylar surfaces in any of the 21 cases.

Curriculum Research in Basic Nursing Education A Progress Report.

Ole Sand, Helen Belcher, NURSING OUTLOOK, 2:86-88, February 1954.

The entire faculty devoted its efforts to restating the existing objectives of the clinical areas of nursing in sufficient detail to be more useful in guiding the selection of learning experience and aiding in the evaluation process.

The clear definition of the changes in student behavior, toward which the work of the total faculty is being directed, is a pioneer effort in curriculum development.

As in most pioneer projects, there are unique features, one of which is the careful study, carried on by the total faculty and student body, of the objectives of the school of nursing and the attempts to relate general to professional education. An analysis of the content areas in which the behavioral changes operate is also significant. The statements on the philosophy and psychology of learning are important features which serve as checks on the desirability and feasibility of the goals of the basic nursing education program. Each faculty member's careful work in determining the contributions of her course or courses to these overall objectives is also noteworthy. The blueprint of the educational program indicating the ends and areas in which we hope to reach our goals has been very useful in carrying on the further planning for the studies that will be a part of this research project. These different types of studies involve working within a single course as well as relating two or more courses. The plans that are being drawn up for the evaluation of the student's attainment of the various objectives appear promising.

Another important feature of this first year of the study is the faculty's observation of group process. Their morale has been high, their interest great, and while no study has been made of these factors in themselves, they constitute an important result of the study. This study should prove valuable to nursing education and general education as well as to the educational programs of other progressional schools, because the problems of more efficient education are significant in every field.

Effects of Positive Tissue Pressure on Blood Flow of the Finger.

S. Yamada, J. APPLIED PHYSIOL., 6: 495-500, February 1954.

In a recent paper it was shown that application of a steady positive pressure to the forearm results in a decrease in the total blood flow to the arm. It is well known that vasomotor tone is graded along the length of the system of vessels and is greatest in the digit, where blood flow is most variable. Therefore, it was of interest to do the same experiments on the blood flow of the finger and to find the range of its critical closing pressure.

As in the forearm, application of a steady positive pressure to the finger reduces its blood flow. When a critical tissue pressure, which is still less than the arterial pressure is applied, the blood flow becomes zero. The difference between the arterial pressure and the tissue pressure which causes cessation of flow, taken as the critical closing pressure, is significantly greater than zero. When the subjects are taken from vasoconstriction to full vasodilation by heat, the range of the critical closing pressure for the finger is from 10 to 56 mm Hg, very similar to that of the forearm. In spite of the similar range of critical closing pressures, finger blood flow is much more variable than forearm flow. This can be attributed to the presence in the forearm of muscle flow, which is less variable than skin flow, and also to the presence of arteriovenous anastomoses in the finger. There is a highly significant correlation between the level of the critical closing pressure in the finger and the resistance to flow at high pressure. This is interpreted to mean that the vessels which close are the arterioles, which contribute the major part of the resistance to flow.

Some Difficulties in Evaluating Functional Results After Mitral Commissurotomy.

L. A. Soloff and J. Zatuchni, J.A.M.A. 154:673-676, February 20, 1954.

Any accurate evaluation of the results of mitral commissurotomy is very important because the procedure has an immediate higher mortality (6 per cent) than the naturally occurring annual mortality (1 per cent) and because of its high morbidity. To date, the reports of so-called functional improvement following mitral commissurotomy represent at best, short term results as compared with the duration of the natural history of rheumatic fever.

To accurately assess the functional improvement after commissurotomy many other factors also must be considered. Among these are the fact that most persons with mitral stenosis and failure can obtain functional improvement with medical management. Mitral stenosis also has an episodic nature and the interval between episodes of worsening of the functional status of the heart may vary from weeks to months and longer. To be meaningful, reports attributing functional improvement to mitral commissurotomy should prove (1) that medical and naturally occurring factors were not active, and (2) that no deleterious effects were produced. It is most important that the cardiac status after surgery be compared not with the patient at his worst before medical treatment, but with the patient at his best after adequate medical therapy had been instituted.

In a group of subjects studied by the authors, 41.7 per cent subjected to the commissurotomy procedure had obvious precipitating causes of failure, most commonly a respiratory infection, which possibly would have responded well to medical management and time. Improvement, if any, after surgery is not necessarily due to the operation, this fact aptly brought out by the number of cases where improvement was found after sham operations, the benefit being derived from a psychotherapeutic effect. Only after long follow-up studies, preferably after observation during a situation which had previously precipitated congestion and failure, can one attribute improvement to the operation.

Book Reviews . . . . .

Your Arthritis: What You Can Do About It. *By Alfred E. Phelps, M.D. Revised Edition. Cloth. Price $3.00. Pp. 192; illustrated. William Morrow and Company, New York, 1953.*

A revised edition of the author's publication of 1943 is presented here. Again it is directed at the lay person who suffers from arthritis. The approach to the problem is in clear, factual and conversational language. The book will serve the patient who reads it by its truthful analysis of his situation. Though the picture painted for the arthritic sufferer is not overly optimistic, it will allay many false fears and unfounded suspicions that are common to the disease.

It is stated that arthritics will seldom respond to less than three months of treatment, and sometimes more than eighteen months are required. This is dependent on the type and severity of the disease. The author advocates combinations of drug therapy and physical therapy along with proper rest and exercise. The author considers physical therapy a subsidiary method of treatment which is particularly appropriate during the painful phase of the disease. Short wave and micro-wave diathermy are discussed unfavorably when used in an active case of arthritis. Infrared, paraffin baths, and massage were brought forth as being valuable supplementary treatments for the malady. It is the opinion of this reviewer, that the use of full body immersion tanks should have received some emphasis.

An interesting discussion that is of clinical significance because of its frequent occurrence, was presented on the relationship of climatic factors and their effect on the arthritic. It was brought out that this type of treatment should be used only as a last resort, and in all but a few exceptions the answer to having the patient make a permanent change of residence to a hot, dry climate would be "No." The emotional, social, and financial readjustments necessary in such a move often tends to cancel any benefits that may occur.

During the course of the book certain inaccuracies were encountered, these were minor and primarily due to over simplification for clarity. It was thought, however, that the author's use of casts to prevent deformities of the hip in active arthritis "when pain and muscle spasm are marked" should warrant further discussion as to its relative therapeutic value.

An excellent presentation of the research background and clinical use of cortisone, ACTH, and hydrocortisone is given. The chapter on posture and gait, and their relationship to arthritis is elementary but interesting —the stress being placed on proper foot mechanics and preventive measures.

The book concludes by presenting

the excellent contributions of the Arthritis and Rheumatism Foundation. This organization formulates a national program of research and education, promotes local treatment facilities and rehabilitation for those disabled by arthritis.

It is, in the reviewer's opinion, a book which would be of great value to the patient if recommended by a physician and used in conjunction with a physical therapy program. This is not a text book or a reference book, but is a valuable tool for the arthritic patient.

Pathology. *Editor, W. A. D. Anderson, M.D., F.A.C.P., Professor of Pathology, Marquette University School of Medicine; Pathologist, St. Joseph's Hospital, Milwaukee. Cloth. Price, $16.00. Pp. 1,393; illus. 1,241. C. V. Mosby Co., St. Louis, 1953.*

This volume brings together the specialized knowledge of 33 collaborators. Each writes about the subject in which he is especially interested and experienced. The expressed purpose of the book is "to serve as a textbook, yet it is intended also to have sufficient comprehensiveness and completeness to be useful to the practicing or graduate physician." Although it is difficult for one volume to meet the needs of undergraduate students, advanced students, pathologists, and practicing physicians, the author has come close to fulfilling all these requirements.

In keeping with its function as a textbook the order of presentation is a time tested one. The first 18 chapters, which comprise 448 pages, deal with the general processes of disease; the remaining 27 chapters are devoted to special pathology, the disease processes being considered by systems. Topics of relatively primary importance to the beginning student are in large size type to give them emphasis; and topics of a less fundamental nature, diseases of rare occurrence, or clinical correlation are in small size type. Thus, an attempt has been made to aid the undergraduate student in selecting the fundamentals. The more advanced students will find accurate and authoritative information on most aspects of pathology. More material is included on viral, protozoal, and parasitic diseases and diseases of the nervous system than in most textbooks of pathology. The chapter on radiation effects is especially timely.

Excellent biographical material is listed at the end of each chapter. The list is not intended to be complete but to include sources of additional information and significant contributions to the knowledge of the subject. The advanced student will find these references helpful in guiding his more detailed study.

This second edition of the book is published eight years after the first edition. In this new edition, gross and microscopic illustrations have been added and certain topics shortened or expanded according to current emphasis. The rearrangement of the type into two columns per page makes for much faster and easier reading.

This well-written book, which is without question one of the outstanding texts of pathology, should be of great value to practicing physicians as well as to students.

Physiology. *By Rolland J. Main, Ph.D., Formerly Professor of Physiology, Medical College of Virginia. Revised by Alfred W. Richardson, Ph.D., Assistant Professor of Physiology, Indiana University School of Medicine. Second Edition. Cloth. Price, $7.00. The C. V. Mosby Company, St. Louis, 1953.*

All chapters in this new edition have been revised to keep pace with the rapid advances in physiological research. The original text was prepared for physicians and medical students as a review of the essential changes and basic concepts in advanced physiology. The book has been organized into physiological systems, metabolic systems, homeostatic mechanisms, fluid systems, and the integrative systems of the body. By such an arrangement many body functions are integrated into single chapters. Although the presentation is brief in that conflicting opinions by various investigators are omitted, good discussions are present on fluid and electrolyte balance, the nervous system and circulatory system.

The book is well written. There are, however, a limited number of illustrations. Unfortunately, there is no bibliography and individual investigators are not mentioned in the discussion of the subject to which they have made outstanding contributions. The author mentions the need for brevity in a review text of this type. Yet it is felt that an important aspect of advanced physiology is the bibliography. The book may be recommended to physiatrists and physical therapists for general up-to-date information.

Human Neuroanatomy. *By Oliver S. Strong, Ph.D., Late Professor of Neurology and Neurohistology, College of Physicians and Surgeons, Columbia University; and Adolph Elwyn, Ph.D., Associate Professor of Neuroanatomy, College of Physicians and Surgeons, Columbia University. Third Edition. Cloth. Price $7.50. Pp. 481; illus. 357. The Williams and Wilkins Co., Baltimore, 1953.*

The third edition of this text embraces the latest advances in neurophysiology and neuroanatomy. Although revision of the autonomic system is not extensive, that of the nerve cell and fiber—its degeneration and regeneration—is greatly expanded. The material on the cerebellum, thalamic nuclei and their connections, the subthalamus and reticular system of the brain stem has been rewritten.

The organization of this text is excellent and divides the volume into two parts. The first part covers the general organization of the nervous system, its histological structure and embryology, and some fundamental neurological problems as they apply to man. The material covering the peripheral nerves is good. The second part covers the architectonics of the central nervous system.

The illustrations are all clearly labeled and the photographs, both gross and microscopic, of the brain and cord are excellent. The bibliography lists 8 comprehensive texts and atlases and 516 general and special references. This is an excellent neuroanatomy text, clearly written, and complete within itself.

Effective Use of Older Workers. *By Elizabeth Llewellyn Breckenridge, Executive Secretary, Illinois Committee on Aging. Foreword by Edward L. Ryerson, Chairman, Inland Steel Company, Chicago, Illinois. With special contributions by Elizabeth Hatch, Curtis Gallenbeck, L. S. Barrus and John Bromer. Cloth. Price, $4.00. Pp. 224. Wilcox & Follett Co., Chicago, 1953.*

This book is a survey of the present status of the older workers in industry. There is wide variation in the policies set up by companies to handle the problem of the increasing age of workers brought about by the increase in average life expectancy. This variation is unrelated to the type of business carried on or to the number of persons employed in the business. There appears to be a growing

trend to relax restrictions on maximum hiring age and fixed retirement age whenever this is possible. Often, however, government regulations, union policies, or established company policies make maximum hiring age and fixed retirement age mandatory.

Regardless of existing policies, employees differ greatly in their desire to continue working and in their willingness to accept the fact that as they grow older changes must be made in their way of living and working. Various communal and corporate counseling services currently available for guidance toward a more realistic adjustment to the problems of aging are discussed. The author emphasized that counseling is more effective when started early in life rather than at a time when the problems require immediate attention.

Little attempt is made to set up answers for either the employers or the aging workers, but rather to present the current picture of what is being done to cope with the problem. Older workers in many walks of life are discussed and the author stresses that there are many ways that these workers can be utilized to the maximum benefit of both employer and employee.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Our Book Reviewers for June

Edwin B. Augustin, Chief Physical Therapy, VA Hospital, Butler, Pennsylvania.

James E. Griffin, Associate in Physical Therapy, School of Auxiliary Medical Services, University of Pennsylvania, Philadelphia.

B. Lee Katz, physical therapist in private practice.

Thomas C. Laipply, M.D., Assistant Professor of Pathology, Northwestern University Medical School, Wesley Memorial Hospital, Chicago.

William J. Shriber, M.D., Director, Physical Medicine and Rehabilitation, Beth Israel Hospital, Boston; Assistant in Medicine, Massachusetts General Hospital, Boston.

Classified WANT-ADS

WANTED: QUALIFIED PHYSICAL THERAPISTS, 500-bed, modern, general chronic disease hospital. Salary dependent on experience; liberal vacation and sick leave benefits. Lunches provided. Apply Superintendent, St. Barnabas Hospital, New York 57, N. Y.

PHYSICAL THERAPIST NEEDED for outpatient clinic in well equipped rehabilitation center. Excellent working conditions. Write Dr. Alvin R. Carpenter, Medical Director, Rehabilitation Services, 200 Court Street, Binghampton, New York.

WANTED: QUALIFIED physical therapist. Excellent working conditions. Salary commensurate with experience. Center open Monday through Friday. San Antonio Cerebral Palsy and Crippled Children's Center, 305 Austin St., San Antonio, Texas.

PHYSICAL THERAPIST — REGISTERED; for general physical medicine in outpatient department of new Sinai Hospital; 5-day, 37½ hour week. Liberal sick leave, holiday, and vacation benefits. Good salary with beginning rate based on qualifications. Write Mr. M. J. Lawrence, Director, North End Clinic, 936 Holbrook Avenue, Detroit 11, Michigan.

WANTED: IMMEDIATE opening for physical therapist for work in cerebral palsy treatment center. Good salary. Female preferred. Consulting orthopedist gives medical supervision. Pleasant working conditions. Write: Mrs. Robbie W. Beard, Director, Les Passees Treatment Center for Cerebral Palsy Children, 822 Court Ave., Memphis, Tenn.

WANTED: PHYSICAL THERAPIST qualified to give sound leadership to orthopedic nursing service in well established Visiting Nurse Association already employing two orthopedic nurses. Excellent employment practices. Salary open. Write Director, Visiting Nurse Association, 615 N. Alabama Street, Indianapolis 4, Indiana.

POSITION AVAILABLE for Physical Therapy Consultant with official State Crippled Children's Agency, treating children with orthopedic conditions in outpatient clinics, treatment centers, and in the homes. Must be qualified physical therapist with at least one year's experience. Sick leave benefits, vacation with pay. Apply: Division of Crippled Children's Services, State Department of Public Assistance, Capitol Building, Charleston, West Virginia.

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Classified WANT-ADS

WANTED: PHYSICAL THERAPIST for 76-bed general hospital. Apply: Larimer County Hospital, Fort Collins, Colorado.

FULL-TIME POSITION as physical therapist is open at the Rehabilitation Center in Portsmouth, N. H. Anyone interested please apply to Esther Wilson Klein, Director, 40 Merrimac Street.

WANTED: QUALIFIED PHYSICAL THERAPIST. Dept. being organized; 300-bed hospital. Salary open. Apply Administrator, St. Francis Hospital, Cincinnati 14, Ohio.

WANTED: PHYSICAL THERAPIST. Wonderful community backing. Excellent facilities. Have orthopedic teacher and occupational therapist. Good pay. Apply Foss Elwyn, Supt. Public Schools, Sault Ste. Marie, Mich.

WANTED: PHYSICAL THERAPIST for direct service to include counselling and guidance for public health nurses. Dr. John B. Hall, Medical Director, Cook County Department of Public Health, Chicago, Illinois.

WANTED: QUALIFIED physical therapist For a new 100-bed hospital in growing medical center. Salary good. Paid vacation and sick leave. Apply: Reed B. Hogan, Administrator, Coahoma County Hospital, Clarksdale, Mississippi.

WANTED: QUALIFIED physical therapist experienced in the care of polio patients. Salary open. Eight-hour day. Pleasant working conditions in 300-bed general hospital in midwest. Write Sister Mary Aquin, Administrator, St. Rita's Hospital, Lima, Ohio.

WANTED: SUPERVISOR for Physical Therapy Department, Sidney Hillman Health Center, 16 East 16th St., New York, N. Y. Write or call Dr. Brand, Watkins 4-7744.

WANTED: STAFF PHYSICAL THERAPIST for active department in 80-bed children's convalescent hosiptal affiliated with large university medical center. Good personnel policies; starting salary dependent upon experience. For illustrated booklet and details write to: Mrs. Janet W. Prior, Dept. of Physical Therapy, Rainbow Hospital, Green Road, South Euclid 21, Ohio.

WANTED JULY 1ST: PHYSICAL THERAPIST qualified to supervise new department in modern 450-bed general hospital in heart of Piedmont Carolinas. Excellent working facilities with ample lay assistants; top salary; vacations and retirement benefits. Address replies to Superintendent, Spartanburg General Hospital, Spartanburg, S. C.

WANTED: IMMEDIATELY: TWO qualified field staff physical therapists for home-bound service in a generalized voluntary public health nursing agency to work under qualified physical therapy supervision. Salary dependent upon experience; 40-hour, 5-day wk.; 7 holidays; 22 working days vacation; 12 working days sick leave. Apply Assistant Director, Visiting Nurse Society of Philadelphia, 1340 Lombard Street, Philadelphia 47, Pennsylvania.

WANTED: PHYSICAL THERAPIST to treat patients in their homes and to work with nurses in the prevention of deformities and rehabilitation of the chronically ill. Five-day 40-hour week, 4 weeks' vacation, paid sick leave, Social Security and Retirement Plan. Salary open. Write Leeta A. Holdrege, Director Visiting Nurse Association, Division of Public Health Nursing, Omaha-Douglas County Health Department, 1201 So. 42nd St., Omaha, Nebraska.

Classified WANT-ADS

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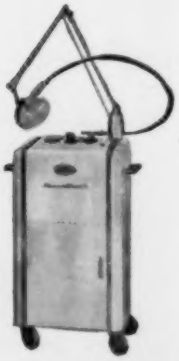

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